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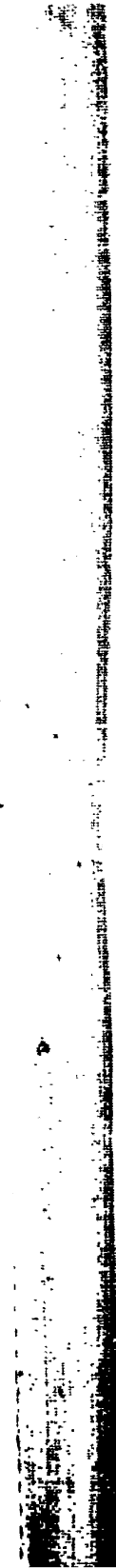
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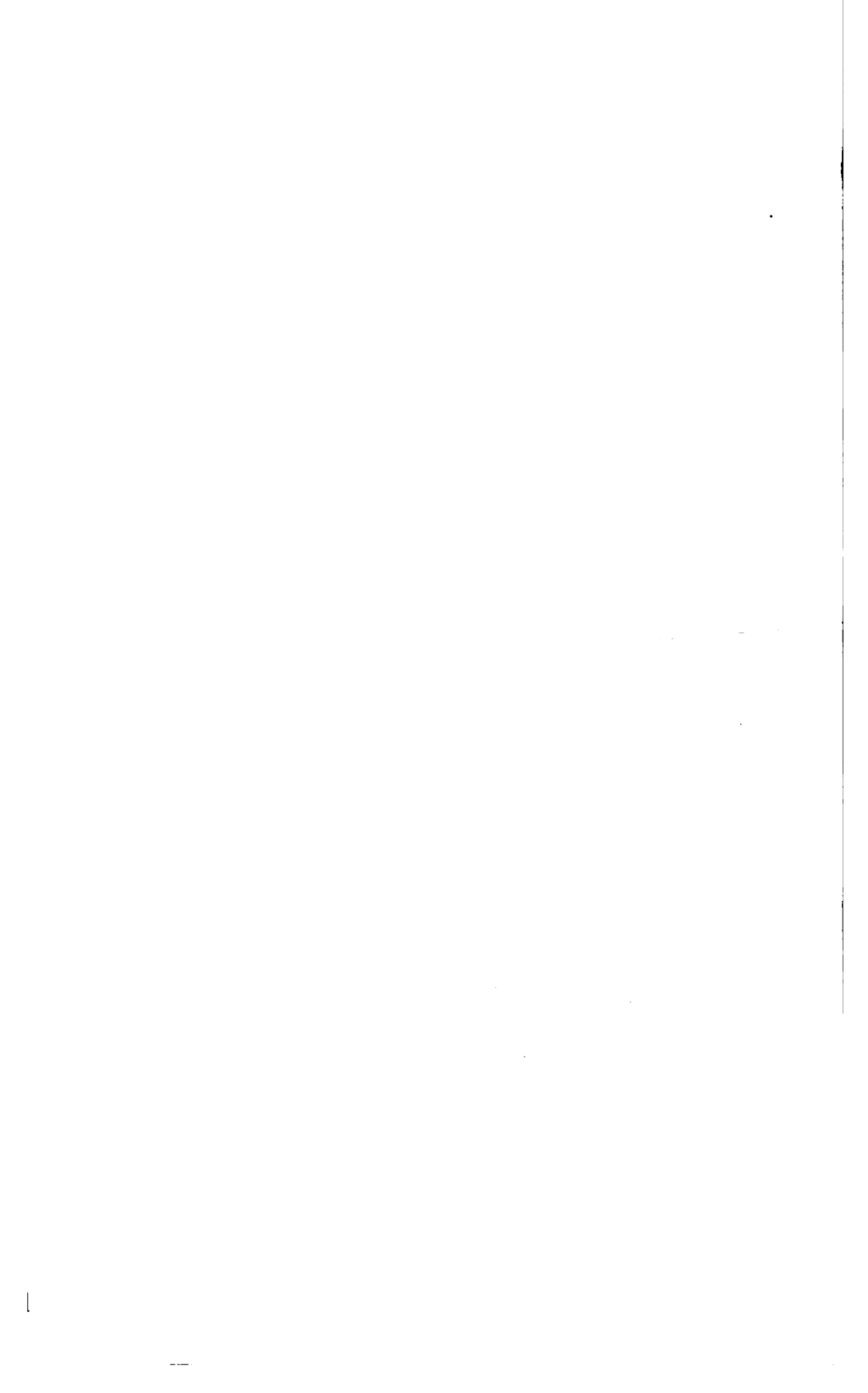
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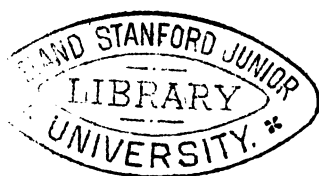




FIRST BIENNIAL REPORT  
OF THE  
STATE BOARD OF HEALTH  
OF  
CALIFORNIA,  
FOR THE YEARS 1870 AND 1871.



SACRAMENTO:  
D. W. GELWICKS, STATE PRINTER.  
1871.



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## CONTENTS OF REPORT.

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	PAGE.
GENERAL REPORT OF THE BOARD.....	1
SALUTATORY—GENERAL PRINCIPLES OF ACTION—SECRERARY'S REPORT...	3
SPECIAL QUESTIONS.....	3
THE USE OF INTOXICATING LIQUORS.....	4
VENTILATION—SCHOOL ROOM DISEASES.....	4
FEMALE HYGIENE.....	6
MUNICIPAL REGULATIONS CONCERNING THE DEAD AND THOSE APPAR- ENTLY SO; BURIAL GROUNDS, Etc.....	7-9
OTHER SPECIAL QUESTIONS.....	9
The supply of water to our cities and towns—Sanitary architecture in our public buildings—The Chinese from a sanitary standpoint—The so-called "social evil problem and how to solve it."	
SEWERAGE.....	10
EXPENSES OF THE BOARD.....	11
REPORT OF THE PERMANENT SECRETARY.....	13
ACT ESTABLISHING THE STATE BOARD OF HEALTH.....	15
Names and residence of the members of the Board—Date of the first meeting.	
OPENING ADDRESS BY DR. T. M. LOGAN.....	16-20
The nature and general bearings of the duties involved in the comprehensive term of "State Medicine"—The application of statistics to public health—The reforms and improvements that have been effected in other countries by sanitary meas- ures, etc.—Allusion to the death of the late Senator, William Burnett, author of the bill creating the State Board of Health.	
ELECTION OF OFFICERS.....	20
STANDING COMMITTEES.....	20
PLACE, HOUR AND DATE OF MEETINGS.....	21
ORDER OF BUSINESS.....	21
REPORT ON LAWS IN EXISTENCE RELATING TO SANITARY MATTERS, BY J. F. MONTGOMERY, M. D.....	21-23
REPORT ON THE SALUBRITY OF PUBLIC INSTITUTIONS.....	23
REPORT BY THE SECRETARY ON PROCURING STATISTICS.....	23-26
Circular to physicians, and to officers and Superintendents of hospitals and other institutions—Circular to Odd Fellows' Lodges—Reply of the Grand Master, I. O. O. F.	



	PAGE.
CRIMINAL ABORTION.....	26-28
REPORT ADOPTED, AND RECOMMENDATIONS.....	29
OFFICIAL TRAVELLING AND VISITATIONS BY THE SECRETARY.....	29-30
Almshouse, San Francisco—Full description (for statistics, see page 62)—Reclaiming land and correcting malaria.	
SAN FRANCISCO CITY AND COUNTY HOSPITAL.....	30-32
Discreditable to the city and county, being old, badly ventilated and overcrowded—Its social and ethical aspects—Sisters of Mercy—Library, etc.	
WATER SUPPLY OF OUR CITIES AND TOWNS.....	32-37
Analysis of water of Lake Bigler—Analysis of Sacramento River and well water—Purity of the former. By Thos. M. Logan, Secretary of the State Board of Health.	
SANITARY ARCHITECTURE OF PRISONS, HOSPITALS, ETC.....	37-41
Report of the Secretary to the Supervisors of Sacramento County—Circular to be addressed to Supervisors, requesting information concerning County Hospitals—Description of Solano County Hospital and its appurtenances—Quarterly report of patients, by S. D. Campbell, Physician—A model report.	
SACRAMENTO COUNTY HOSPITAL.....	41-42
Description of the building—Its defects—Physician and Resident Surgeon—Out-buildings and grounds—Elements for determining location of a hospital.	
RAILROAD HOSPITAL.....	42-43
Description of the building—Cost of its maintenance—Remarkable low death rate.	
REGISTRATION OF MARRIAGES, BIRTHS AND DEATHS.....	43
Discussion respecting difficulties attending it—Subject referred to Secretary to make such suggestions and recommendations to the Legislature as he may deem expedient.	
CONSUMPTION AND A SANATORIUM.....	43
Attention called to the mortality by this disease—Necessity for deciding as to proper climate—Santa Barbara suggested—Deliciousness of the climate demonstrated by meteorological observations.	
THE CHINESE AND THE "SOCIAL EVIL" QUESTION.....	43-48
Letter from the Secretary to Dr. Stout inviting a communication on the subject—The tenor of his response—The President opposed to the discussion—The Secretary defends his position.	
NARRATIVE BY THE SECRETARY OF A MIDNIGHT VISIT TO THE CHINESE QUARTER IN SAN FRANCISCO.....	46
Crowded and filthy cellars—Want of ventilation—Opium smoking—Degraded condition of the Chinese here met with—Danger from amalgamation, etc.	
ACTION OF THE SECRETARY SUSTAINED.....	48
Motion made and carried that he incorporate in report to the Legislature such papers relative to the Chinese and social evil question as in his judgment seem expedient.	
OFFICIAL VISIT TO SOUTHERN PARTS OF THE STATE.....	48-49
VITAL STATISTICS.....	49-60
Table exhibiting by counties the number of marriages, so far as reported, for the year 1870; also, the nationality of the couples and the relative nationality of the sexes.	
Table exhibiting by counties the number of births registered during the twelve months from July, 1870, to July, 1871; also, the sexes, the live-born and the still-born.	
Table of diseases, accidents and deaths in thirty-eight Lodges I. O. O. F., for the six months from July, 1870, to January, 1871, with the results.	
Table showing the total mortality, as well as that by the most prevalent diseases, in twenty-four localities, comprising nearly half the population of the State, with	

the ratio of deaths to one thousand population, from July, 1870, to June, 1871, inclusive; also, the authorities for the data.	
Table showing the annual and monthly mortality, as well as the race, age and nativity of the decedents, in twenty-four localities, comprising nearly half the population of the State, from July, 1870, to June, 1871, inclusive.	
Table of mortality of prevalent diseases, by months.	
Comparative table of the deaths in some of the principal cities in the United States, showing the ratio of deaths per one thousand of the population.	
<b>HOSPITAL STATISTICS.....</b>	<b>60-71</b>
Table of twenty-four charitable institutions, exhibiting the number of indigent sick, with the results, and the percentage of deaths to the cases; also, the total average percentage of deaths.	
Report of the Physician of the State Prison—Letter to the Secretary of the State Board of Health—Table of date, nativity and disease of decedents—Number of cases admitted, discharged and treated in Hospital, from May 1st, 1870, to May 1st, 1871. By Alfred W. Taliaferro, M. D., Attending Physician.	
Report of the San Francisco Female Hospital, from July 1st, 1870, to June 30th, 1871, inclusive. By Professor C. T. Deane, M. D., Physician in Charge.	
First annual report of the San Francisco Lying-in and Foundling Hospital, December 31st, 1870. By Benjamin F. Hardy, M. D., Attending Physician and Surgeon.	
<b>MEDICAL TOPOGRAPHY AND CLIMATOLOGY—GENERAL REMARKS. ....</b>	<b>72-75</b>
Comparative table of meteorological results in the following twenty-seven stations in the Pacific States, viz: Fort Yuma, San Diego, Monterey, Fort Miller, San Francisco, Benicia, Sacramento, Marysville, Fort Reading, Aurora, Hope Valley, Strawberry Valley, Fort Jones, Astoria, Port Orford, Red Dog, Nevada, Shingle Springs, Vacaville, Stockton, Niles, Livermore, Chico, Auburn, Colfax, Reno, Santa Barbara—Coast climate, interior climate, mountain climate, and chart of rainfall, from August, 1870, to July, 1871, in forty stations.	
<b>SANATORY RETREATS.....</b>	<b>75-89</b>
Medical topography of Santa Barbara—Statistical table for eighty-eight years, from the foundation of the Mission to January 1st, 1871. By M. H. Briggs, M. D., of Santa Barbara.	
Addenda by the Secretary of the State Board of Health—Vital statistics—Meteorology—Monthly mean temperature, range of temperature, relative humidity and force of vapor. By Rev. J. A. Johnson, editor <i>Santa Barbara Press</i> .	
Santa Barbara as a sanatorium. Extracted from the <i>Santa Barbara Press</i> of April 1st, 1871. By S. B. Brinkerhoff, M. D., of Santa Barbara.	
Medical topography of San Diego County—Abstract of a report to the State Medical Society. By D. B. Hoffman, M. D., of San Diego.	
Meteorology of San Diego—Letter to the Secretary—Five months observations. By G. W. Barnes, M. D.	
Table of mortality in San Diego City and County—Remarks in connection therewith—Eleven deaths by consumption accounted for. By T. C. Stockton, M. D., Secretary of the County Medical Society.	
<b>CONCLUDING REMARKS.....</b>	<b>89</b>

## CONTENTS OF APPENDIX.

	PAGE,
<b>FEMALE HYGIENE</b> .....	3-17
A lecture delivered by request of the California State Board of Health, at Sacramento, on the 28th of April, 1871, and at San Francisco, on the 25th of May, 1871. By Horatio R. Storer, M. D., of Boston, Mass.	
<b>MUNICIPAL REGULATIONS</b> .....	18-43
Concerning the dead and those apparently so; their treatment; regulations respecting burial grounds, interment of the dead, etc. Translated from the "Hand-Book of Sanitary Police," by Dr. L. Pappenheim, Berlin, 1870. By Professor L. C. Lane, M. D., of San Francisco.	
<b>THE "SOCIAL EVIL" QUESTION</b> .....	44-53
A letter in response to an application from the Hon. J. D. Burlingame, of the Nevada Legislature, desiring information on the subject; also, a copy of the bill introduced and lost, to regulate houses of prostitution. By Arthur B. Stout, M. D., of San Francisco.	
<b>REPORT ON CHINESE IMMIGRATION</b> .....	54-77
Letter from the Secretary of the State Board of Health—Response—Part I: Impurity of race as a cause of decay; the remedy—Part II: Hereditary or ante-natal causes of decay; the remedy—General resume of the whole subject. By Arthur B. Stout, M. D., of San Francisco.	
<b>SCHOOL ROOM DISEASES</b> .....	78-85
From the circular of information of the Bureau of Education, August, 1870, Washington. Translated from the German, and illustrated with a drawing. By Dr. R. Virchow, of Berlin, Prussia.	
<b>SCHOOL HOUSES AND THEIR VENTILATION</b> ....	80-101
A lecture delivered before the Sacramento County Teachers' Institute, on the 27th of September, 1871, and before the State Teachers' Institute, San Francisco, on the 8th of November, 1871. Illustrated with drawings and designs. By Thos. M. Logan, M. D., Secretary of the State Board of Health.	
<b>DRAFT OF AN ACT FOR SANITARY PURPOSES</b> .....	102
Registration of births, marriages and deaths; establishment of local Boards of Health; sewerage, cleansing and scavenging; slaughter houses; markets; cellars; ventilation; epidemic and contagious diseases; public vaccination; interment of the dead; general provisions.	

**R E P O R T**  
**OF THE**  
**STATE BOARD OF HEALTH.**



## GENERAL REPORT OF THE BOARD.

OFFICE STATE BOARD OF HEALTH, }  
Sacramento, Cal., November 1st, 1871. }

To His Excellency,

H. H. HAIGHT,

Governor of California :

Under a deep sense of the responsibilities involved in the comprehensive term of "State Medicine," to the administration of which we have been appointed, and with an earnest desire to grapple successfully with the various difficulties surrounding the commencement of this new and important branch of the public service, we entered on our duties conformably to the law enacted on the eighteenth of March, eighteen hundred and seventy.

We rejoice, as citizens, that the advanced intelligence of the people, through their legislative representatives, have recognized the principle above all others by which society subsists, of the sacredness of human life, which cannot be impaired or wasted by neglect, any more than it can rightfully be taken by violence; and we rejoice still more, as members of a philanthropic profession, that a needful provision has now been made, through the established channels which the progressive experience and the constantly increasing demands of civilization both require and render practicable, for securing the lives, the health and the social protection of the people, in accordance with the well defined truths of hygienic science, as related to civil government.

We tender our congratulations as to the good health that has prevailed in the State since our inauguration, and of which the facts and figures herewith presented furnish substantial proof; thus affording us a just and safe standard for future sanitary comparisons.

### GENERAL PRINCIPLES OF ACTION.

Before entering upon a new and untried field of operations, we have thought it proper to define the general principles by which we expect to be guided.

We believe that a reciprocity of action, subtle and recondite, is constantly taking place between the physical, moral and intellectual condi-

tions of man; and that although these conditions are not capable of being explained demonstratively, still they may be so controlled by the aid of the powerful hand of the medical sciences, that the body, intellect and soul may be trained in a more perfect and well balanced order, than it is possible for them to be otherwise than by such agencies. We believe that no Board of Health, if it rightly performs its functions, can separately treat these three qualities of man—that they are indissoluble, and mutually act and re-act upon each other, and that it is only by the careful and comprehensive study of the laws of nature and the correlation of forces operating throughout the physical world, that the highest department of the physician's art can be brought into operation, and applied to the advancement of the race.

Whether such measures will ever be the means of perfecting man's nature and condition, or not, there can be no doubt that a continual amelioration of his circumstances and development of his powers must result from the dissemination of the knowledge acquired by those who are arduously and incessantly laboring for humanity, not only by the most self-sacrificing devotion to their peculiar mission—healing the sick and searching out the occult causes of disease—but, also, by helping forward every worthy human interest, and promulgating every scientific discovery and beneficent invention.

For the prosecution, therefore, of the work before us, there can be no arrogance in claiming that none are better prepared than physicians, inasmuch as their preparation lies in the possession of the knowledge essentially necessary to the proper performance of their professional duties; and “that knowledge tells us, in no doubtful terms, that the fate of man is in his own hands. If this knowledge were exact, and our means of application adequate, we should see the human being in his highest state of perfection—in the harmonious proportion and complete balance of all his parts, as he came out of his Maker's hands, in whose Divine image, we are told, he was in the beginning made.”\*

But these glorious anticipations can never even approximate a realization, until Hygiene, the science of health, armed with the power of the State, comes to be fully understood, and its regenerating influence applied and appreciated; “until we explore and pursue to their very sources, those multitudinous agencies, whether physical, whether moral, whether born of earth, of air, or of society, which are either openly or insiduously degenerating the human race.”†

In this spirit, and with these principles in view, yet by methods and with uses that have been devised for daily necessities in the care of public health, the organization and duties of the Board have been directed. And no higher compliment can be paid to the enlightened spirit that is beginning to pervade the public mind in regard to the State Board of Health, and the duties connected therewith, than the testimony which we now bear to the fact, that the people, as well as the profession, have spontaneously and heartily aided in giving effect to every measure proposed.

It is not for us to estimate the importance of the information secured by the methods employed; yet we cannot withhold the opinion, that as a science, cultivated with a view to State purposes, it is almost, if not quite, an unexplored theatre of action. Having for its ends not only the preservation of life, but also the development of life—life, in all its evolutions

and manifestations—in the energy of strength, in the power of intellect, in the efficiency of mind as well as body, we are not prepared to comprehend its immense proportions, nor even to approximate the brilliant results which we believe are to be attained through the practical application of its life and health-giving principles.

#### SECRETARY'S REPORT.

To the report of our Permanent Secretary we refer for an account of our organization and a summary of the most important matters of public interest that have engaged our attention up to the present time. The peremptory requirements of the Board immediately upon its sudden inauguration, in the absence of any vital statistics in every part of the State except San Francisco and Sacramento, devolved upon him the necessity of devising some general plan in accordance with such methods as the principles of sanitary science have already established, for the purpose of determining the real condition of the State as regards the relative fecundity and mortality of her population, the causes of death within her borders, the weight with which each cause of death presses upon different portions of the community, whether those portions be considered in relation to age, sex, or condition of her people, or in relation to different sections of her territory.

There was no time for hesitation or delay in attempting to secure the requisite data for these ends. To meet the emergency, the Secretary gratuitously assumed the additional duties of the office of Registrar of births, marriages and deaths—an office altogether extraneous to the one he holds by our selection, and which, as is well known, is confided in our sister States to a distinct and separate bureau. These additional duties have involved on the part of our executive officer an extraordinary amount of correspondence and travel, which has kept him continually occupied in the discharge of the self-imposed functions of two distinct offices, either one of which exacts for its proper execution, the constant services of a competent statistician.

We take occasion, while testifying to the imperfections of the present system, which will be manifest on the face of the results, and which has been merely improvised to meet the emergency, to recommend, for legislative enactment, the "Draft of an Act for establishing a systematic registration of births, marriages and deaths; also, Local Boards of Health, and for other sanitary purposes," that has been prepared by our Secretary. Knowing from experience, with the workings of this Board, the measure in which his efforts have been successful or unsuccessful, such changes, recommendations and suggestions as in his judgment appear necessary for co-operative and harmonious action throughout the State, in the still further promotion of the public good, are worthy of your attentive consideration and approval.

#### SPECIAL QUESTIONS.

It was the unanimous opinion of the Board not to attempt too much, at first, that would swell this report beyond a readable and convenient size for public use, but rather to study those questions only which are pressing most grievously on every class of society, and are endangering the people's safety and curtailing the blessings of life. Accordingly, it was decided to take up the following subjects:



true that in the gymnasia and play grounds, and during the hours of relaxation and rest at home, the youthful system will throw off, or rather recuperate from the detrimental influence of the day's unnatural confinement; but, too often, this beneficent law of nature is frustrated by the imposition of tasks and lessons to be studied out of school. Cooped up from morning to night in the confined air of the house, like celery plants banked from the bright light of day for the sheer purpose of being bleached, our school children, beyond the age of eight years, are as a general rule not allowed to enjoy sufficiently the glowing, vivifying sensations which a swift current of oxygenated blood communicates to their body.

These abuses of the school system, and the consequent effects of its stringent discipline upon the health of pupils, has been made the subject of scientific investigation in Prussia and other States in Europe, and steps are now being taken in our own country, by the Educational Bureau at Washington, in the right direction, by the translation of a very important paper by Dr. Virchow, of Berlin, the highest authority of the day. This brief but valuable paper will be found in the Appendix, with an illustration of one of the most deplorable forms of disease, created by a common, but improper posture at the school desk. A single glance at such results will show the value of sanitary knowledge, and should arrest the attention of statesmen and legislators. Upon our children rests the hope of the State; and upon the observance of those hygienic laws by which they are to be conducted to the productive period of life depend State wealth, power and greatness, and, upon their neglect, result decay and ruin.

#### FEMALE HYGIENE.

The opinion having obtained currency that the female portion of our community are more proclivous in California than elsewhere to those functional and organic derangements which are peculiar to the sex everywhere, we have felt constrained, while not subscribing to the popular belief, not to ignore a question of such momentous import. Gifted with "a dower, all of love and suffering from her birth," and more prone, from education and the habits of refined life, to the numerous ills in which she participates as a common lot with man, nature has superadded to woman's share all those ills which take their rise in the superior excitability of her nervous system, and in those painful and stormy functions which qualify her for becoming a mother. We need not therefore be surprised at the frequency of her impaired health, as compared with that of man. To this apparent proportional illness, more apparent in California, especially heretofore, because of the relative paucity of the female population, is to be ascribed, in a great measure, the erroneous idea to which we have alluded. Another reason for this current opinion is found in the difficulty of curing many of the host of female complaints, not so much from want of competency in medical men generally, but from the delicacy of the relations existing between the sexes, and from the embarrassment arising from fastidiousness on the part, either of the female herself, or of the practitioner, or both, and, in a good degree, also from want of information among the population in general, as to the import, meaning, and tendency of disorders, manifested by certain symptoms. Many of these disorders are, in their beginning, of light and trifling importance, yet by neglecting them in their rise, on the one hand, or by imprudently treating them by violent and disturbing therapeutical or surgical methods on the other, the whole constitution may at last come

into sympathy with the deranged member of it, and the health and happiness of the mismanaged and misinformed female are sacrificed, and so her usefulness and life are lost to the State.

Towards obviating the perpetuity of these evils, which have existed from all time and in all places, and which strike at the vitals of society, we believe that it is our plain duty to disseminate such hygienic counsels, as, if they may not have the power of always preventing the misfortunes to which female life is subject, will certainly weaken the morbid influences which produce them.

We believe, also, that there is a great amount of communicable information withheld by the medical profession, which it is their duty to spread abroad and make common for the public good. Actuated by such considerations we extended an invitation to Dr. H. R. Storer, of Boston, who has made the diseases of woman a special study, to deliver a public lecture on "Female Hygiene," that would meet all the issues at question. Many physicians appear to entertain the idea that their knowledge cannot be imparted to the people without infringing upon their obligations to their profession, and that it is better, in fact, that the world should not be possessed of such recondite information as theirs. We are happy to be able to state that Dr. Storer was influenced by no such obsolete and non-progressive ideas, but cheerfully acceded to our wishes. His lecture, which is now published in the Appendix of this report for more general diffusion, was delivered in May last, both in San Francisco and Sacramento, before appreciative audiences of ladies and gentlemen, and we are gratified to be able to add that it was well received, and is calculated, in our opinion, to redound to the good of the State.

#### MUNICIPAL REGULATIONS CONCERNING THE DEAD AND THOSE APPARENTLY SO; BURIAL GROUNDS, ETC.

The above caption covers an important branch of sanitary reform, bearing on the public health, to which our attention has particularly been directed. As nothing is more certain than death, so nothing is more uncertain at times than its reality. Numerous instances are recorded of persons prematurely buried, or actually at the verge of the grave before it was discovered that life still remained, and even of some who were resuscitated by the knife of the anatomist. Allowing much of fiction with which such a subject must ever be mixed, there is still sufficient evidence to warrant a diligent examination of the means of discriminating between real and apparent death in cases of suspended animation, from drowning, asphyxiation from hanging, gas, charcoal, smothering, and other causes. Indeed, the horror with which a mistake of the living for the dead is contemplated, should induce us to neglect no available means by which such an event so repugnant to our feelings may be avoided.

For the purpose, therefore, of spreading abroad the latest and most valuable information to be derived from the highest authorities at our command, on the subject of the resuscitation of the apparently dead, as well as on the burying of the dead, especially with a view to discourage and prevent intramural cemeteries, we have appended to this report a translation by Dr. L. C. Lane, of this Board, of an elaborate article by Dr. L. Pappenheim, of Berlin, entitled "Leichenpolizei," or, municipal regulations concerning the dead.

The control of cemeteries is properly viewed as a municipal affair

and as such it ought to be studied and regulated with an eye solely to the public good; yet so little has been done in this respect that it is easy to foresee that unless some compulsory enactments are passed, enforcing compliance with necessary regulations as to location and amplitude of space, not many years will elapse before those burying grounds now established in our young but rapidly growing cities and towns will be surrounded by a dense population.

It is difficult to induce the inhabitants of any new town to look beyond their present wants, but the experience in different parts of the world, attending the practice of intramural burials, has almost always brought about a uniform course of legislation, both civil and canonical, prohibiting such practices. Better now, when land is of less value, force the people to take action looking to the future, especially while there is a growing disposition to provide for another important sanitary measure—"public parks"—a subject for future consideration.

Among the many facts that might be adduced in support of what we have advanced, we would briefly state that it has been found that the soil of a burial ground in which a succession of bodies, in large numbers, has been laid, becomes in process of time unfitted to bring about the putrefactive changes in bodies of more recent deposit, so as to render them, in a great degree, innocuous. The soil, under such circumstances, becomes saturated and animalized (to adopt language of recent introduction as applied to this subject) to such a degree that it cannot be disturbed without exhaling poisonous vapors and gases, which in many instances have proved suddenly fatal to those who inhaled them. In a report of the General Board of Health in London, it is shown that, from the law of the diffusion of gases, these emanations spread rapidly through the whole atmosphere and act injuriously on the health of the people resident in the immediate neighborhood of the places from which they issue. Evidence is adduced to show that severe complaints almost invariably proved fatal; and also that the pestilential atmosphere thus formed became a fit radius for the poison of cholera during the fatal year of eighteen hundred and forty-nine.

To give an idea of the importance attached to this subject in Europe, we will give a brief summary, as a precedent for our action, of the legislation practised elsewhere. The French law requires that five years must elapse before the same grave can be opened for a second interment, so that time may be allowed for the decomposition of the body first inserted before another is deposited in its place. In the case of the City of Marseilles, with a population of about one hundred thousand, and an annual mortality of three thousand persons, it has been estimated that six thousand square metres, or about six thousand five hundred square yards of ground, would be required for the purpose of interment during a single year, assuming that to each body separately to be buried, there ought to be allowed a space of two square metres, or six and a half square feet. But as five years must elapse between successive interments in the same spot, the entire extent of ground necessary for the burial wants of a population of one hundred thousand persons, is thirty thousand square metres, or about thirty-two thousand square yards. It was decreed in eighteen hundred and eight, under the Empire, that there should be no dwelling built, or well dug, within one hundred and twenty-five yards of the new cemeteries. In Prussia, the distance of cemeteries from towns varies from one hundred to one thousand yards. Some English writers recommend an interval of six hundred to seven hundred yards between the two.

Various estimates have been made of the time that must elapse before the entire decomposition and destruction of the body, leaving only the bones entire. These range from forty years to fourteen months. Much, in all these calculations, must depend on the nature of the soil in which interments take place. The legislation on the subject of the time that should intervene between the deposit of dead bodies in the same grave also varies. In Hesse Darmstadt and in Prussia an interval of thirty years is exacted; in the City of Leipsic, fifteen years; in Milan, ten years; in Munich, nine years. Much less difference occurs in the enactments prescribing the depth of the grave opened for the reception of a dead body. In most countries, including Russia, this is somewhat more than six feet; in Frankfort-on-the-Main, it is four feet seven inches; and in London the bishop used to direct a depth of between four and five feet.

"Without being called upon to look at the subject of intramural interments, under its purely moral and religious aspects, we are, nevertheless, free to allude to the depressing, and, at such times, morbid influence exerted on the community by its being compelled to witness the frequent, and in visitations of certain fearful epidemics, the almost continual succession of funeral processions. This is a matter of public health, in discussing which medical testimony cannot be overlooked. Were it necessary, clerical experience could also be invoked in favor of suburban burials, in preference to those in or near the city, whether regard be had to the desirableness of the uninterrupted solemnities of the burial service, the avoidance of whatever would grate on the already-harrowed feelings of attending relatives and friends, and the preserving unbroken the associations of an elevated and religious character, with the sight of the memorials of the dead, and of the spot where their bodies rest."

We have dwelt somewhat at length, and rather recapitulated, on this topic, because in the use of the knowledge obtainable from the many different sources at our command and worthy of being brought to bear in aid of sanitary reform, it will be safer to subject ourselves to the charge of iteration, rather than of failure to impress the public mind with the vast importance of the questions considered. "We must not imagine," says the elegant and learned writer,\* from whose valuable report, on the importance and economy of sanitary measures to cities, we have just quoted, and to which we are indebted for many of the facts and arguments adduced in this report, "that a knowledge of sanitary matters, possessed by a small number of intelligent and inquiring minds, is at all indicative either of the knowledge or the zeal of the public at large. Our reform, like every other that has been successful, requires iteration, and again iteration."

#### OTHER SPECIAL QUESTIONS.

There are yet several other matters to which our attention has been directed, but which cannot be considered as disposed of definitely, and still remain as open questions. For this reason they will be referred to more particularly in the Secretary's report, in the connected form in which they came up for our deliberation. Among these we would instance especially, "The supply of water to our cities and towns, for sewerage as well as domestic purposes;" "Sanitary architecture in our public buildings;" "The Chinese from a sanitary standpoint;" and the so-called "Social evil problem, and how to solve it."

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\* Report by John Bell, M. D., to the American Medical Association.

It will be noticed that the latter subject was considered by the Board long before the late action that was taken thereon by the San Francisco Board of Health.

#### SEWERAGE.

This important subject, as will be seen in the "Draft of an Act for sanitary purposes," etc., prepared by our Secretary, has received the thoughtful consideration of the Board. Where the population are scattered over the face of our agricultural counties the disposal of sewage is easy, as it is directly applicable for the utilization of the soil; but in the case of cities, the question is one of the most difficult problems of the day, and one which we are not prepared to report definitely upon at this time.

Its disposal is generally accomplished either by water, or by removal in the recent or deodorized dry state, as practised in hot climates. This latter mode, which in India is termed "conservancy," is not suited for a dense city population, as the frequent removal produces great nuisance, and the necessary deodorization is apt to be neglected. The best form for the collection of sewage on this plan is Moule's Earth-closet. The daily amount of solid sewage is three ounces, and of fluid about four ounces for each person, and this in a large community requires for its removal an amount of water which can hardly now be obtained from the present system of water supply to our cities and towns, and which necessarily, as population increases, cannot be obtained.

A remedy, in this state of the case, has been recently proposed, in an able article presented to the State Medical Society by Dr. A. B. Stout, by substituting the salt water of the Bay of San Francisco. One objection to this, however, is to be found in the fact that salt water promotes the decomposition of sewage. Possibly the production of ozone in the sewers by electrolysis, as suggested in the paper just referred to, may remedy the evil attendant upon the use of salt water.

To this subject we purpose giving our close attention, with the view of testing the correctness of the theory. There is no doubt that the time is approaching when, by a process of deodorization, sewage will be rendered innocuous and will be applied to fertilizing the land everywhere. The attention of the most able chemists and sanitary engineers is now fixed on the subject. "The great efficacy of ozone, or oxygenated oxygen, as a disinfectant, is known, as well as its use on a small scale in the wards of hospitals; so is its production by the decomposition of water with the galvanic current; but its generation in large quantity in the midst of sewage and from the waters of the sewage itself during their passage through sewers, has not [until lately] been proposed." Should these propositions prove practicable, the greatest boon ever conferred on mankind by means of the application of science to art, shall have emanated from the State Medical Society.

#### EXPENSES OF THE BOARD.

It will be seen that the expenses of the Board have fallen within the limit granted by the State. It is the intention of the Board so to manage the means at their disposal that the same results may always attend; while, at the same time, they will earnestly endeavor to make their investigations and reports as valuable as circumstances will permit.

*Expenses of State Board of Health, to October 31st, 1871.*

Salary of Secretary from April 22, 1870, to Oct. 31, 1871...	\$3,813 04
Travelling expenses of Secretary.....	56 80
Rent of office from April 22, 1870, to Oct. 31, 1871.....	915 00
Expressage, postage, and other office expenses.....	70 50
Travelling expenses of Henry Gibbons.....	327 60
Travelling expenses of L. C. Lane.....	280 80
Travelling expenses of Luke Robinson.....	315 00
Travelling expenses of F. Walton Todd.....	126 00
Travelling expenses of C. E. Stone.....	20 00
Total .....	\$5,924 74

Respectfully submitted in behalf of the California State Board of Health.

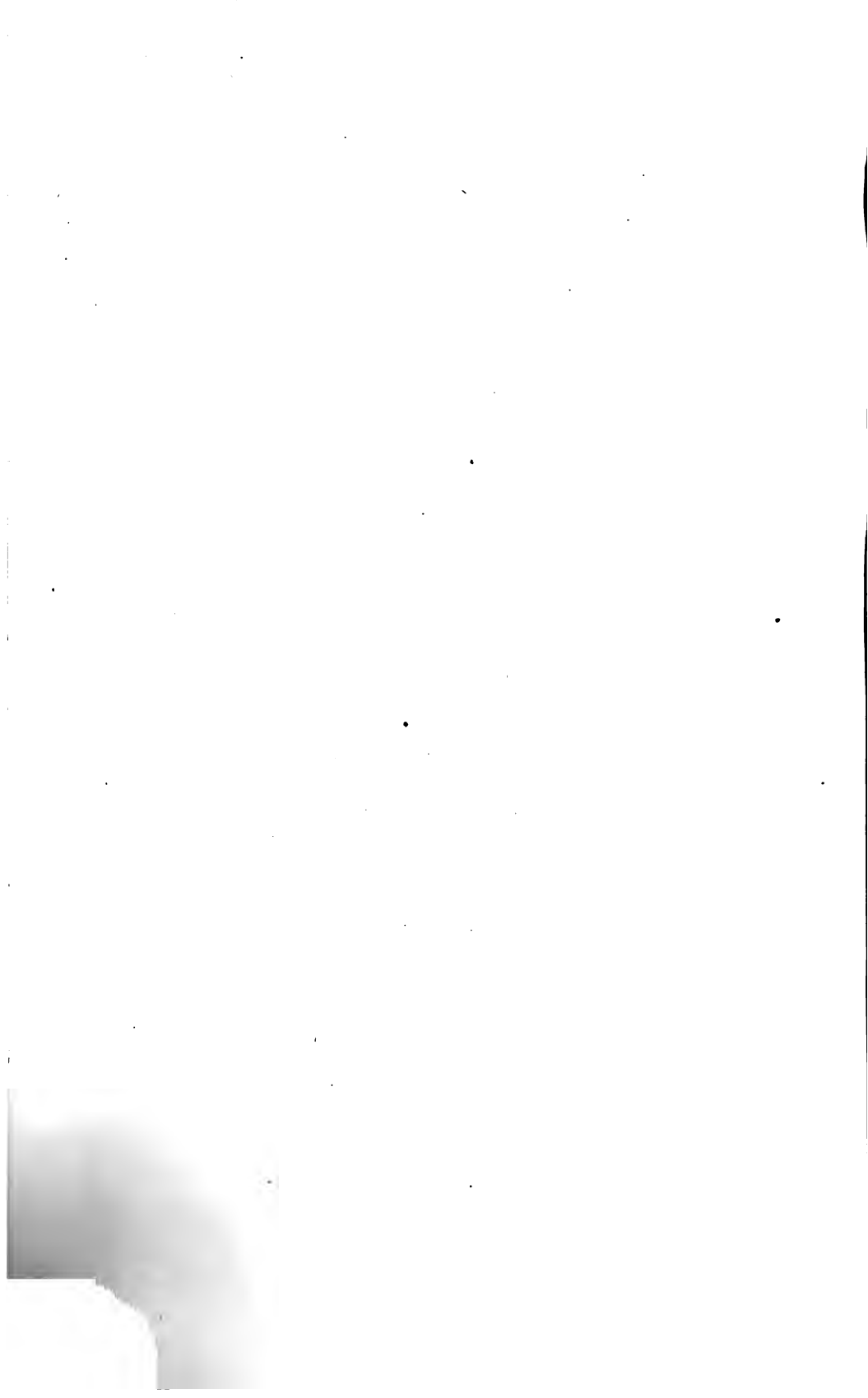
THOS. M. LOGAN, M. D.,  
Permanent Secretary.

SACRAMENTO, November 1st, 1871.



**R E P O R T**  
**OF THE**  
**PERMANENT SECRETARY.**





## REPORT OF THE PERMANENT SECRETARY.

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*To the State Board of Health :*

GENTLEMEN : The following history of the Board, and of their proceedings in relation to public sanitary matters, will explain, in a connected form, the kind of work in which we have been engaged and what we have accomplished since our organization.

### ESTABLISHMENT OF THE BOARD.

The Act establishing a State Board of Health in California is as follows :

SECTION 1. The Governor shall appoint seven physicians, two from the City of Sacramento and the other five from different sections of the State, who shall constitute the State Board of Health and Vital Statistics. The physicians so appointed shall hold their offices for four years and until their successors are appointed, and all vacancies in the Board shall be filled by the Governor.

SEC. 2. The State Board of Health shall place themselves in communication with the Local Boards of Health, the hospitals, asylums and public institutions throughout the State, and shall take cognizance of the interests of health and life among the citizens generally. They shall make sanitary investigations and inquiries respecting the causes of disease, especially of epidemics, the source of mortality and the effects of localities, employments, conditions and circumstances on the public health ; and they shall gather such information in respect to these matters as they may deem proper for diffusion among the people. They shall devise some scheme whereby medical and vital statistics of sanitary value may be obtained, and act as an advisory Board to the State in all hygienic and medical matters, especially such as relate to the location, construction, sewerage and administrations of prisons, hospitals, asylums and other public institutions. They shall, at each biennial session of the Legislature, make a report of their doings, investigations and discoveries, with such suggestions as to legislative action as they may deem proper.

SEC. 3. It shall be the duty of the Board, and they are hereby instructed, to examine into and report what, in their best judgment, is the effect of the use of intoxicating liquor, as a beverage, upon the industry, prosperity, happiness, health and lives of the citizens of the State ; also, what legislation, if any, is necessary in the premises.

SEC. 4. The Board shall meet at the Capital of the State, at least once in every three months, and as much oftener as they may deem proper. Their first meeting shall be held at the Capital, at the expiration of one week after their appointment shall have been made, and three members shall always constitute a quorum for business. They shall elect from their own number a President and Permanent Secretary; the latter shall reside at the Capital, and shall be their executive officer. No member, except the Secretary, shall receive any compensation; but the actual travelling expenses of the members, while engaged in the duties of the Board, shall be allowed and paid out of the General Fund.

SEC. 5. The Secretary shall perform and superintend the work prescribed in this Act, and shall perform such other duties as the Board may require. He shall also furnish to the Legislature, when in session, such information cognate to this Act as from time to time they may deem necessary. An annual salary of twenty-five hundred dollars, and his office and other necessary expenses incurred in the performance of his duties, shall be paid to him in the same manner as that of other State officers.

SEC. 6. The expenses of the Board, including the salary of the Secretary, shall not exceed four thousand dollars a year.

SEC. 7. This Act shall take effect and be in force from and after its passage.

In accordance with the provisions of this Act, his Excellency, the Governor, appointed the following named physicians to constitute the State Board of Health, their commissions bearing date April fifteenth, eighteen hundred and seventy:

1. Thos. M. Logan, Sacramento.
2. J. F. Montgomery, Sacramento.
3. Henry Gibbons, San Francisco.
4. L. C. Lane, San Francisco.
5. F. Walton Todd, Stockton.
6. C. E. Stone, Marysville.
7. Luke Robinson, Colusa.

The first meeting was held in Sacramento, all the members being present, except Dr. Stone, who was ill at the time, on the twenty-second of April, eighteen hundred and seventy, at the office of Dr. T. M. Logan, who called the meeting to order and delivered the following

#### OPENING ADDRESS.

*Gentlemen of the State Board of Health:*

At the instance of his Excellency, the Governor, it has devolved upon me to call you together for the purpose of organization. As you are aware, the last Legislature, with the broadest statesmanship, regarding the personal and individual strength and availability of each and every member of the body politic—"the bone and muscle that create, and the mind and spirit that control, direct and enjoy all earthly possessions"—as the essential element of the State to be cared for, as well as more material interests, has instituted and appointed a medical tribunal or Board of State Medicine, for counsel and guidance in cases where the lives and health of the people are concerned. Recognizing, too, the fact

that the advancement of hygiene generally, and preventive medicine in particular, which has commenced to attract so much attention, is undoubtedly owing to the application of statistics to public health by the progressive minds of the medical profession, they have provided that seven physicians shall be selected from different sections of the State to constitute the ministers of that tribunal, and, given them the amplest means to draw their levies of information directly from the separate areas of their observation; and, marshalling them from time to time at the Capital, drill them through the necessary evolutions and combinations to those conditions and forms that will make them useful and valuable.

Whether we consider the unmeasured ground covered by the comprehensive idea, or the scope of the objects embodied in the organic law, we cannot but acknowledge the high compliment that has been paid to our profession, and rejoice at its recognition in the councils of the State. While, however, we felicitate ourselves upon the honor conferred on our noble profession, through each one of us, in our selection by his Excellency for this high trust, permit me to explain briefly my conception of the nature and general bearings of the duties confided to us. Before doing so, let us at this opening up of our labors, in the same lofty spirit that has ever actuated the true disciples of medicine, resolve to act harmoniously in encouraging, improving and developing this most worthy institution. Let us, with minds loyal to the Hippocratic oath, and under a deep sense of our individual obligations to the public and to each other, elevate it from the lower level of speculation and partisanship, which has been charged against it, to the higher plane of true science and humanity. Then, when the people shall be made to understand the economic and political importance of public health and salubrity, shall our efforts be appreciated, and the wholesome lessons of domestic and civil hygiene, emanating from us, shall be respected as the rules and defences for the person, the domicile, the municipality and the State.

According to my construction of the late sanitary legislation respecting a State Board of Health and Vital Statistics, etc., its members are to look after the vital interests and physical condition of the people, just as the Boards of Education and Agriculture look after and promote the intellectual and productive powers intrusted to them. Like these Boards, so successful and useful in their administration, ours, in pursuit of its purpose, is to find its own way of usefulness and lay its own plans of operation. We are to endeavor to create an interest in our work among the lay as well as the professional public, and to raise up friends in all parts of the State to co-operate with us in our investigations in gathering sanitary information and in spreading it again abroad. We are to encourage the formation of Local Boards of Health, the registration of births and deaths and marriages, whereby mortality and other reports touching the vital condition of the people may be obtained monthly, and if possible, weekly. In such reports we will find the first indications of the vital condition of the various parts of the State—the drift of all epidemic influences and the dangers that may be impending. We will learn when and in what circumstances life has its largest expansion and the smallest burden; where childhood, in the largest proportions, survives the perils of its years, and prepares the greatest number of men and women for responsible and self-sustaining life; and, on the other hand, we will discover the places and circumstances where, of

those who are born, the fewest pass through the dangers of infancy to become workers in society.

Other vital statistics would also come under our supervision, of deep import, both as a matter of political economy and of science. By statute we have a visitatorial power over all State asylums, hospitals, almshouses, prisons and other public establishments and charities wherein the sick, insane, blind, idiotic, deaf and dumb, and criminals are kept, or which receive any bounty or support from the State. As the reports from these institutions are now made (detached and disconnected) they fail to convey their full lessons of instruction, and are comparatively useless, both to the physician and the statesman. But when all their common facts shall become centralized in one Board and presented in one form to the Legislature, they will be made to subserve a higher purpose in medical and sanitary philosophy, as evidence of disease and its prevalence in various forms, or as pointing to cause and leading to means of prevention. With the knowledge thus acquired, by pushing our inquiries in every possible manner, and growing in extent and importance from year to year, we will be enabled by our reports, publications, the press, and perhaps by the lecture room, to make the people cognizant of the pernicious influences that are sapping the foundations of their health and happiness; press upon their attention the laws of hygiene, and persuade them to regard their vital force as their most precious gift, by which all others are to be weighed and to which everything else must be subordinated.

Apprehensions have been expressed lest in this land of liberty the sanitary measures sought might press too heavily on the individual and lessen too much the freedom of personal action. It seems to me this is not likely, if we pursue with due circumspection the course just sketched out. Our duties are not executive, but advisory; and so long as the State acts cautiously, and on well assured scientific grounds, there is no danger but that the observance of our sanitary rules will be voluntary and not compulsory. There may be cases, however, in which it will become necessary to compel obedience to the rules of hygiene. For example, pure air and pure water are necessities of life; but an individual may have little control over these elements, and may be powerless to prevent other persons from contaminating them, and thus striking at the very foundations of his health and happiness. Here, as in many other emergencies that may arise, the State must step in for the protection of its citizens and enact rules which shall be binding upon all.

There will, however, be some cases in which the State cannot easily interfere, though the individual may be placed under unfavorable hygienic conditions by the action of others. For instance: in many trades and occupations the employes are subjected to numerous dangers from the carelessness, or avarice, or ignorance of the employers. Especially in the dwellings and lodgings of the poorer classes, the cupidity of builders runs up houses of the most miserable structure, without ventilation—dark, damp and dreary. The growth of sanitary knowledge and the pressure of public opinion can alone work a cure in these cases. In the older countries, possessing a more advanced civilization, we do not find that the working of State medicine has been found oppressive or objectionable; but on the contrary, the advantage of having a central health authority to which appeal can be made in disputed points is acknowledged by the people, who have been brought up to the point of recognizing its expediency, and who not only acquiesce but aid in the enforcement of its decisions.

In England, France, Germany, Austria and Prussia it has been demonstrated, from carefully compiled statistics, that life is no more a fixed and unalterable quantity or quality in man than it is in domestic animals, or in fruits and grains. It has been found that, where external circumstances are unfavorable, and personal habits are bad, there health is low, disease is abundant and fatal, and life is short. But where these circumstances and habits are changed for the better, sickness has diminished, death is less frequent and life protracted. In agricultural districts, by improving the laborers' cottages, removing waste heaps of decaying animal and vegetable matter, and draining wet and marshy grounds, the death-rate has been reduced fifty per cent. In London, especially, the largest city in the world, has the increase of the probability of life been most plainly seen. In some districts, where the mortality was thirty to forty in one thousand before the improvements, it was only thirteen to fifteen in one thousand afterward.\*

In Holland dreary swamps have been converted into fertile fields, and flourishing cities built upon spots where the foot of man could not once have trodden with safety. Calcutta, built on the swampy side of the Hooghly, and surrounded by lakes, has, by a proper system of drainage of that part of the city inhabited by Europeans, become as healthy as any country of the same latitude on the globe; while Stockholm, with a mean temperature of forty degrees, and possessing every natural advantage requisite for health, is, because of gross sanitary defects, the unhealthiest city in that quarter of the globe, as shown by its death rate.† These and numerous other facts and reasons, demonstrating what sanitary reforms have effected after the best intelligence and observation had pointed out the way, I refrain from dwelling on, as, doubtless, they are obvious corollaries from data already in your possession. These reforms were not begun until the people believed them to be possible, nor could they have made their rapid progress without the instrumentality of Government. It must be confessed that our civilization in the United States has, until very recently, failed to apply its resources of intelligence and power to modify and diminish the deleterious influences which, in manifold ways of sorrow and suffering, weigh heavily on all classes of our citizens. The work of sanitary reform is yet to be begun. Grievous evils permeate, with worse than leperous poison, the heart of American society. They not only endanger the people's safety and curtail the blessings of life, forestalling the work of Herod, but entail lasting injury in the deterioration of race—in the seeds of disease transmitted to future generations—in the degeneracy and decay which are already too apparent.

Massachusetts has been the first State to become awakened to the danger of the situation, and the "Memorial of the Boston Sanitary Association"‡ to the Legislature, in eighteen hundred and sixty-one, and from which I have freely drawn in preparing these remarks, has been answered by the institution of a State Board of Health, whose first annual report I now present for your consideration. You will perceive that the late action of our State has been based on that of Massachusetts, and we may with reason congratulate ourselves upon California being the first State to follow in the footsteps of the most enlightened Commonwealth in America. To this excellent stand-

\* Chadwick's Address at Glasgow, September, 1860.

† Report of California Assembly Committee on State Board of Health bill; also, "Physical and Medical Topography of Wheeling, Virginia," by James E. Reeves, M. D., 1870.

‡ By Edward Jarvis, M. D., of Dorchester, Massachusetts.

ard we may well continue to model all our future actions and work up to it, like the artist, as the nearest approximation to the conception of what has been formed in our own minds of the great and good work before us. Upon our high or low appreciation of the position to which we have been appointed, and upon our judicious performance of the duties therein involved, depends the accomplishment of the objects aimed at in the establishment of a State Board of Health in California.

I cannot bring these remarks to a close without reminding you of a melancholy incident connected with the occasion. The author of the statute which has convoked us here—he who, probably, would have presided over this humanitarian scheme; he, too, who perfected that successful measure, the object of which was the lifting the Insane Asylum from the mire of party politics, and whose gallant struggle in the Senate in this behalf should never be forgotten—while yet we believed him in his orient, has set in the west forever. In the twilight of doubt and perplexity he has left us, with naught to cheer us onward but the memory of his works, which, like the rays of the departed sun, point up to Heaven. By this calamity, so sudden and unexpected, let us be admonished to preserve a chastened spirit, and to unite with our confidence in Heaven a realizing sense of our own weakness and dependence. Let us, in the vivid remembrance of our transitive existence, and in the practical application of those incorruptible principles which have given the name of Burnett a niche in the political history of the State, as well as in the temple of our science, banish the rivalries of self-love and of interest in controverted points, and never forget that we are in the presence of One who is the arbiter of all truth—the source of all knowledge—the great moral Physician of a disordered world.

The Board now proceeded to the election of a President and Permanent Secretary.

Dr. Henry Gibbons, of San Francisco, was unanimously elected to the first office; and Dr. T. M. Logan, of Sacramento, also unanimously, to the second office.

On taking the chair Dr. Gibbons made some appropriate remarks, suggestive of various plans for diffusing knowledge on special subjects, connected with public hygiene, by the publication of monthly reports, or oftener, if necessary, on mortality and other questions; by lectures in different parts of the State, on matters connected with public health, and chiefly by our reports to the Legislature, which should be so plain and intelligible that they would attract the attention and interest of the public. He also suggested that the Secretary invite the co-operation of medical societies and the profession generally in the great philanthropic work before the Board, so as to make it a real blessing to the State, not only for the present, but for all future time.

On motion of Dr. Lane, the President appointed Drs. Lane, Montgomery and the Secretary, a committee to draft rules for the government of the Board.

The following were also appointed:

#### STANDING COMMITTEES.

Committee on the Salubrity of Public Institutions, Schools, Hospitals, Prisons, Factories, etc.—Dr. C. E. Stone, Marysville; Dr. J. F. Montgomery, Sacramento; Dr. F. Walton Todd, Stockton.

Committee on Statistics relating to Life and Health, Modes of Employment and of Living, and the Comparative Healthiness of Different Localities—Dr. F. Walton Todd, Stockton; Dr. L. C. Lane, San Francisco; Dr. Henry Gibbons, San Francisco; Dr. Luke Robinson, Colusa.

Committee on Intoxicating Liquors, Inebriate Asylums, Pathological Influences of Alcohol, etc.—Dr. J. F. Montgomery, Sacramento; Dr. Henry Gibbons, San Francisco; Dr. L. C. Lane, San Francisco; Dr. Luke Robinson, Colusa.

Of these different committees, the Secretary was likewise by resolution made a member, as well as ex officio the Executive of the Board.

After some further desultory discussions respecting various suggestions for fulfilling the ends and objects of the Board, an adjournment to meet again on the twenty-second of May, proximo, at the office of the Secretary, was carried.

Agreeable to adjournment the Board met on the twenty-second of May, eighteen hundred and seventy-one, when Dr. Montgomery, from the committee to draft rules for the government of the Board, in the absence of Dr. Lane, Chairman, reported that inasmuch as the organic law creating the Board had prescribed the laws and regulations to govern the same, it would only be necessary to name the place, hour and dates of the meetings, and therefore recommend:

*First*—That the place of the meetings of the Board be at the office of the Permanent Secretary on the last Friday of the months of February, May, August and November.

*Second*—That special meetings be called at any day by the Secretary, at the request of any two members, at the same place and hour.

The following order of business was also recommended:

1. Call to order.
2. Reading minutes.
3. Correcting, amending and confirming minutes.
4. Reports of Standing Committees.
5. Reports of Special Committees.
6. Communications.
7. Unfinished business.
8. New business.
9. Adjournment.

The report and recommendations of the committee were unanimously adopted.

Dr. Montgomery also reported, as follows, from the committee appointed to ascertain what laws are already on our statute books respecting sanitary measures:

That upon careful examination of the statutes of the State he could find but little upon the subject, and that little of trifling value in effecting the purpose designed.

An Act was passed and approved in March, eighteen hundred and fifty-two, providing for a Vaccine Agent, to be appointed by the Governor, but as no compensation is provided, except what he may obtain from the charge for virus furnished and from the certificate accompany-



ing each parcel as to its genuineness, no one seems to care to hold the office, and consequently the law is inoperative.

An Act to promote the study of Anatomy, approved April fourth, eighteen hundred and sixty-four, may be found at paragraph three hundred and twenty-five, volume one, of Hittell. It authorizes any physician or surgeon, duly qualified according to the laws of this State, to receive and use, for anatomical purposes in this State, the body of any one required to be buried at public expense, preference being always given to medical schools in this State, the privilege to be exercised under certain conditions and restrictions. The fourth section of this Act was amended at the session of eighteen hundred and sixty-five and six, the amendment being approved March twentieth, eighteen hundred and sixty-six. It is very stringent in its provisions, requiring the physician receiving the body to get a certificate from a medical society or Board of Supervisors as to his good character or fitness, and to give bonds that he will use the body within the State for anatomical purposes only, and that he will finally bury the remains in some public cemetery, at his own expense, and have a record made of name and burial. This amending Act may be found on page three hundred and twenty-six of the statutes of California.

An Act to establish a quarantine for the bay and harbor of San Francisco, and sanitary regulations for the City and County of San Francisco, approved April second, eighteen hundred and sixty-six, may be found in statutes of California for eighteen hundred and sixty-five and six, page seven hundred and forty. A new law of this character was passed at the session of the Legislature just closed, and it, of course, would have repealed the one here alluded to.

An Act providing for the registration of marriages, births, divorces and deaths was passed in eighteen hundred and fifty-eight, and approved April twenty-sixth, eighteen hundred and fifty-eight; amended March twelfth, eighteen hundred and fifty-nine, and repealed April twenty-seventh, eighteen hundred and sixty. No similar law has been passed since.

An Act was passed, as we know, at the late session, creating a Board of Health for San Francisco, and investing them with ample power for efficiency; but until the statutes of that session shall have been issued next month we cannot be fully informed of its provisions, or of those of any other Act of the same session relating to similar subjects.

Under head of crimes and punishments (Hittell, Vol. I, par. 447) it is provided that any one who may procure abortion by means of drugs or instruments, or any woman who may allow such abortion to be produced upon herself, shall be imprisoned, upon conviction, in the State prison not less than two nor more than five years; *provided*, that no physician shall be punished who, in the discharge of his professional duties, deems it necessary to produce abortion to save the life of the woman. Nor shall said woman be punished under the same circumstances. Nor shall such physician be punished on the testimony of such woman alone.

#### *. Supplementary Report.*

In statutes of eighteen hundred and sixty-nine and seventy, page seven hundred and sixteen, is an Act to establish a quarantine for the bay and harbor of San Francisco, and sanitary laws for the City and County of San Francisco. This law confers ample powers upon the

Board of Health of San Francisco to establish and enforce regulations for the preservation of the public health.

At page four hundred and fifty-two is an Act conferring additional powers on the Board of Health of Sacramento, a thing much needed.

At page three hundred and thirty is an Act to prevent the kidnapping and importation of Mongolian, Chinese and Japanese females, for criminal and demoralizing purposes.

Under the head of anatomy, on page four hundred and five, statutes of eighteen hundred and seventy, appears an Act to promote the study of anatomy, approved March twenty-sixth, eighteen hundred and seventy. Section one provides that any physician or surgeon duly qualified according to the laws of this State, or any medical student under the authority of such physician or surgeon, may obtain, as hereinafter provided, and have in his possession, human dead bodies or parts thereof, for the purposes of anatomical inquiry or instruction.

Section two requires any Sheriff, Coroner, Warden of county poor-house, public hospital, county jail or State prison, or the Mayor or Supervisors of San Francisco, shall surrender dead bodies required to be buried at public expense to persons named in the first section; *provided*, no such dead person requested that he be buried, or any friend of such, within twenty-four hours make like request, or if such person be a stranger.

Section three requires that every physician or surgeon, before receiving a dead body shall give to the officer surrendering the same, a certificate from a medical society of the county in which he resides; or, if there be none, from the Board of Supervisors, that he is a fit person to receive such dead body. He shall also give a bond, with two sureties, the amount or penalty for forfeiture not named, that the body by him received shall be used only for the promotion of anatomical science within this State only, and that after being so used, the remains thereof shall be buried in some public cemetery, and the usual record made of name and burial, at the expense of the physician being in possession of such body.

Dr. Stone, from the Committee on the Salubrity of Public Institutions, reported that in consequence of his absence at the last meeting of the Board, and his not exactly understanding the nature of the duties of his committee, he would ask for further time.

The President trusted the Board would continue the committee, and recommended that they be instructed to inquire, as far as practicable, into the prevailing diseases in the different public institutions, their causes and mode of treatment; as well as the general sanitary condition of the respective establishments. *Nemine contradicente*, the committee was so instructed and continued.

The Secretary reported from the Committee on Statistics, that circulars and blanks had been prepared and printed for distribution and correspondence with the members of the profession in different parts of the State, as well as with the officers and superintendents of hospitals and public institutions, of which the following is a copy:

[CIRCULAR.] •

DEAR SIR: The undersigned have recently been appointed by the Governor to constitute the "State Board of Health," under an Act passed by the last Legislature.

In entering upon our duties, we desire to enlist your services, that all

may work together for the common advantage of the people, for the prevention of disease, and for the prolongation of life. Due credit will be given to you in our biennial reports to the Legislature, for any aid or assistance you may think fit to extend to us in the great work before us.

According to the arrangement of the accompanying blanks, it is intended that they shall be faithful weekly or monthly records of the more important diseases and accidents occurring in the practice of the physician and surgeon in whose hands they may be placed.

In the registration of observations which may be made in reference to medical or surgical cases, it is requested that the various items of information, as soon as they are obtained, be temporarily noted down, in order to secure accuracy in the statistics, and at the end of each week or month to record such observations in the appropriate columns of these blanks, according as they are designated by their headings. The name of the disease or character of the accident must be written as distinctly as possible, and it is requested that the classified nomenclature herewith subjoined be consulted as a guide in the registrations. It is desirable that they should be accompanied by remarks, or explanatory notes, from each individual observer, stating in particular the pathological indications afforded by post mortem examinations; also, any peculiarities that may have manifested themselves during the progress of the disease, either in respect to epidemical or endemical influences, or the marked effects of remedial agents. *Accurate diagnosis should characterize every registration.* It is expected that the number of blank spaces left for registration of cases will be amply sufficient as a general rule; but if at any time they should fall short, a blank sheet of paper may be attached at its lower end, and so the statistical tables continued to any extent required.

In making this appeal to your professional obligations, we sincerely hope that it may serve as the opening of friendly and helpful relations between us, and that it will lead to reforms, the effect of which will be evident in the improved condition of public health. Communications addressed to our Secretary will be thankfully acknowledged.

Very respectfully, your obedient servants,

HENRY GIBBONS, Sr., M. D., Pres't,  
L. C. LANE, M. D.,  
F. W. TODD, M. D.,  
C. E. STONE, M. D.,  
LUKE ROBINSON, M. D.,  
J. F. MONTGOMERY, M. D.,  
THOMAS M. LOGAN, M. D., Sec'y,  
State Board of Health.

The Secretary also informed the Board that he had devised a plan, with the advice and consent of the Grand Master, as will be seen by the accompanying circular, to procure from the different Odd Fellows' Lodges in the State a monthly statement of the sickness and deaths therein occurring. As these Lodges are largely composed of the most intelligent, sober and industrious portion of our fellow citizens, it is believed that the vital statistics therefrom derived will afford a fair index of the sanitary condition of the various localities wherein they are situated.

## [CIRCULAR.]

*To the N. G. and members of ——— Lodge, No. ———, I. O. O. F.:*

**BROTHERS:** The undersigned have recently been appointed by the Governor to constitute the "State Board of Health," under an Act passed by the Legislature. In entering upon our duties, which are purely humanitarian, we desire to enlist the aid of the benevolent Order of I. O. O. F. in our investigations, which are prompted by one sole motive, viz: the improvement in human health, and the lengthening out of the life of each individual man and woman in the State. Certainly no object can be nobler—none more deserving of the attention of the philanthropic.

It would require a more lengthy communication than this circular admits of to explain fully how it is expected that the desirable results aimed at may be advanced through your co-operation. We trust this is unnecessary, but that it will be sufficient to state simply, in order to gain your valuable aid, that we are in want of the statistics, which can be readily furnished by filling out monthly, through your Secretary, the blank spaces under the several headings of the accompanying forms. It is believed that a proper and skilful analysis of such data cannot fail to give birth to much useful knowledge, which would ultimately redound to the good of the Order, and lead to important and highly beneficial reforms. Science would, also, be greatly benefited by the facts and testimony of such reliable and exact records, and the workings, as well as literature, of the Order, acquire a value and importance not otherwise easily attainable. The trouble, to each Lodge, of contributing its experience for the public welfare would be very trifling, while the advantages would be immense.

The Board feels confident that the statements just presented will have some weight with the more reflecting and intelligent of our brothers, and will stimulate them to further exertion in the holy cause of rendering the cherished institution of Odd Fellowship more broadly beneficent, and of more efficiently and practically developing the great principles upon which it is based.

The intelligent members of the Order—the *elite* of the working classes in California, both morally and mentally—will surely not lag behind the times in this age of progress, but will rather press forward in the van of the great intellectual army, which is now so rapidly achieving the most glorious of conquests—the subjugation and ultimate extirpation of the great enemy of social, moral and physical progression—ignorance of the laws of hygiene. They will rather, it is confidently believed, from the inmost recesses of their respective Lodges, cheerfully echo back the dying words of the illustrious Goethe—"Let in more light!"

In behalf of the Board,  
Your Brother in F., L. and T.,

THOMAS M. LOGAN,  
Permanent Secretary State Board of Health.

I. O. O. F.

OFFICE OF THE M. W. GRAND MASTER,  
R. W. GRAND LODGE OF THE STATE OF CALIFORNIA, }  
Sweetland, Nevada County, June 1st, 1870.

*To the Secretaries of all Lodges subordinate to the R. W. Grand Lodge:*

In obedience to a resolution adopted by the Grand Lodge at its last session, you are hereby directed to furnish the information requested by the State Board of Health, in the accompanying circular, by filling up the blank forms sent you by the Secretary thereof, promptly at the end of each month, and forward them regularly to him.

Fraternally,

C. W. DANNALS,  
Grand Master.

#### CRIMINAL ABORTION.

At the meeting on the twenty-sixth of August, eighteen hundred and seventy-one, Dr. Montgomery addressed the Board on the subject of criminal abortion. He said the guilt of those who resort to this abominable practice should be exposed and punished with the utmost severity. He believed that one of the reasons of the frightful extent of the crime is to be found in the grave defects of our laws. Our duty is plain. We should publicly express our abhorrence of this unnatural and rapidly increasing crime, avow its true nature as no simple offence against public morality and decency, but the most wanton and murderous destruction of human life; and that, while he would not have this Board transcend its legitimate province or invade the precincts of the law, he would recommend to the Legislature a careful examination and revision of the laws that relate to this subject.

Dr. Gibbons fully coincided with the gentleman in his remarks respecting the crime of abortion. Its frequency among all classes of society, rich and poor, most physicians, from their practical experience with its deplorable results, have known for some time past. The causes of this general demoralization are manifold; but one of these lies at the door of the profession themselves, who, at times, omit precautions or advisory measures that might prevent its occurrence. As a profession, however, he thought we were unanimous in condemnation of the crime. Mere resolutions to this effect and nothing more are, therefore, merely evasive and useless. He hoped the Secretary would make a note of all that had been implied in these remarks, so as to bring the whole subject before the Legislature at its next session, in his biennial report.

In accordance with the foregoing expressed wishes of the Board, the Secretary herewith introduces the following "Report on Criminal Abortion," submitted to the American Medical Association by a committee appointed to investigate the subject *with a view to its general suppression*:

The heinous guilt of criminal abortion, however viewed by the community, is everywhere acknowledged by medical men.

Its frequency among all classes of society, rich and poor, single and married, most physicians have been led to suspect—very many, from their own experience of its deplorable results, have known. Were any

doubt, however, entertained upon this point, it is at once removed by comparisons of the present with our past rates of increase in population, the size of our families, the statistics of our foetal deaths, by themselves considered, and relatively to the births and to the general mortality. The evidence from these sources is too constant and too overwhelming to be explained on the ground that pregnancies are merely prevented; or on any other supposition than that of fearfully extended crime.

The causes of this general demoralization are manifold. There are three of them, however, and they are the most important, with which the medical profession have especially to do.

The first of these causes is a wide spread popular ignorance of the true character of the crime—a belief, even among mothers themselves, that the foetus is not alive till after the period of quickening.

The second of the agents alluded to is the fact that the profession themselves are frequently supposed careless of foetal life; not that its respectable members are ever knowingly and intentionally accessory to the unjustifiable commission of abortion, but that they are thought at times to omit precautions or measures that might prevent the occurrence of so unfortunate an event.

The third reason of the frightful extent of this crime is found in the grave defects of our laws, both common and statute, as regards the independent and actual existence of the child before birth, as a living being. These errors, which are sufficient in most instances to prevent conviction, are based, and only based, upon mistaken and exploded medical dogmas. With strange inconsistency the law fully acknowledges the foetus in utero, and its inherent rights, for civil purposes; while personally, and as criminally affected, it fails to recognize it, and to its life, as yet, denies all protection.

Abundant proof upon each of these points has been prepared by the committee, and is elsewhere \* being published to the profession; but as the statements now made are almost axiomatic, such recapitulation would be here wearisome and is unnecessary.

Our duty is plain. If, by any act, we can effect aught towards the suppression of this crime, it must be done. In questions of abstract right the medical profession do not acknowledge such words as expediency, time service, cowardice. We are the physical guardians of women—we, alone, thus far, of their offspring in utero. The case is here of life or death—the life or death of thousands—and it depends almost wholly upon ourselves.

As a profession, we are unanimous in our condemnation of the crime. Mere resolutions to this effect, and nothing more, are therefore useless, evasive, cruel.

If, to want of knowledge on a medical point, the slaughter of countless children now steadily perpetrated in our midst is to be attributed, it is our duty as physicians, and as good and true men, both publicly and privately, and by every means in our power, to enlighten this ignorance.

If we have ever been thought negligent of the sanctity of foetal life, the means of correcting the error are before us. If we have ever been so in deed, there are materials, and there is good occasion for the establishment of an obstetric code, which, rigorously kept to the standard of our attainments in knowledge, and generally accepted by the profession,

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\* North American Medico-Chirurgical Review, January, 1859, *et seq.*

tionable in all of its arrangements and appointments, were it not for the lowness of ceilings in the basement wards, and the absence of provision for ventilation, and of course for proper warming.

It is supplied with pure water from a spring in the vicinity, by means of a steam pump. From the pump one thousand feet of three-inch discharge pipe has been laid to the tanks, and from the tanks to the main building five hundred feet of two-inch service pipe, giving an abundant supply to every floor. The pneumatic gas has been in constant use the past year, and in point of safety, compared with coal oil lamps, is far superior, and for light and safety equal to that of the city gas, at a far less cost.

About eighty acres of ground are inclosed and cultivated by such of the inmates as are able to work, which supply the institution with nearly everything required for food; that portion in front of the main building being laid out in gravel walks, flower beds and lawns. In this way the excellent condition of the place is maintained, and an air of general neatness, order and cheerfulness imparted.

For a statement of the admissions and relative proportion of deaths, we refer to the table showing the results of twenty-four charitable institutions, in the article headed "Vital Statistics."

#### RECLAIMING LAND AND CORRECTING MALARIA.

Besides the skill exhibited in the internal administration of the San Francisco Almshouse, the Superintendent has displayed great ability in designing and carrying into operation sanitary improvements on the farm, to which I would here call special attention, as they are worthy of imitation in all malarial localities.

On the northeast corner of the tract was a little swamp, probably about three and a half acres in extent. This marsh was kept moist and damp by springs of water, and proved the source of miasmatic exhalations. Before six months had expired after Mr. Keating had entered on his duties, he reclaimed this land by causing a number of ditches to be dug, about six feet apart, and deep enough to get down to a solid foundation. Stone was then hauled from a neighboring quarry and placed in a layer, one foot deep, and then covered over with sod. The ditch was now filled up with soil, forming what is known as the blind drain. This work was done by the inmates, costing nothing, while the reclaimed land will more than supply the house with vegetables. Altogether, the Almshouse of San Francisco is a model institution, from which the Supervisors of the different counties of the State may profitably copy.

#### SAN FRANCISCO CITY AND COUNTY HOSPITAL.

Dr. Gibbons regretted to have to state that the Public Hospital in San Francisco was a disgrace to the county, so far as a proper regard for ventilation and provision against over crowding are concerned. If, as it has been definitely determined, that not more than one hundred sick can be kept under one roof without an increased mortality being the result, what must be the consequences of the packing together of more than three hundred patients in a nest of badly constructed wooden buildings, can be scarcely imagined. It is true, the patients are not kept in one ward, or one story, but from a sanitary view it does not make much difference whether they are confined in one large room, or in different wards, or are divided up into separate stories—the evil

results are the same, and arise from the absolute impossibility of proper ventilation. He said that an effort, in fact, a commencement, had been made toward erecting a better adapted building, and securing a more suitable location, but from some cause not known to him, the whole matter seemed to be in a state of suspension. He did not even know whether an annual report had been prepared, such as is required of all hospitals, but he would make an effort to procure one.

The Secretary regrets to have to state that no report has yet been received. He does not pretend to say to whose neglect this failure is to be attributed, but he cannot refrain from expressing the opinion that a Florence Nightingale is much needed, in this particular instance, to stir matters up. While the efficient medical staff is well aware that the present building is quite inadequate to the needs of the institution, they have no power nor means to modify the evils complained of. The location is ill-adapted to invalids—the chilling oceanic winds blowing with all their well known force directly upon it, through the Golden Gate, and the fogs settling down upon it from the top of Telegraph Hill, at the base of which the hospital stands.

A scheme has long been before the Board of Supervisors for the construction of a new and more commodious hospital in the southern portion of the city, and two hundred thousand dollars, it is believed, were appropriated by the Legislature for this purpose two years ago; but difficulties as to the title of the ground at first selected have impeded progress. Even as it now is, the City and County Hospital ranks among the most beneficent institutions of San Francisco, and as an offset to its defects, and presenting a more cheerful side to the discouraging view just taken of this great charity, the following extract, from a late number of the San Francisco *Bulletin*, is appended:

“The social and ethical aspects of hospital life in this hospital might form a not uninteresting article if space permitted us to dilate upon them. The visits of the good Sisters of Mercy are always hailed with respectful looks and silence by patients of all religious denominations. Indeed, their cheerful looks and sympathetic words carry a home-like and humane feeling to many a rough wanderer. The instinctive homage of our moral natures, even when sunk far beneath its normal grade, to goodness, is here cheerfully exhibited. That the Sisters are women has, of course, a secondary influence, but we believe the secret of the welcome they receive from non-Catholics is that their conventional formula (for of course they must say pretty much the same thing beside many beds) is entirely free from cant. Not so, too often, is it with the well-meaning tract propagandists of our traditional faith. The text, the tract, the warning, the exhortation, the minute questioning, so provocative of deceit in low minds, are too frequently forced upon the impassive invalid like a medicine to be swallowed *volens volens*. Hence, occasionally (happily only rarely) the ignorant blasphemer—who is right so far as this: that these missionaries have a weak side to them which is inherent in their unwise method of attempting conversion—treats them with scurrility and insult. Yet even in such rare instances we have noticed that the object aimed at by the vituperative patient is applause and the credit of wit from his room-mates, whereas the looker-on plainly sees that every one but himself is thinking him a blackguard. That we may not be thought unfair in our remarks on the excellent persons we have referred to, we will state the fact that a few Sabbaths since the inmates of the house heard a tremendous vocalization proceeding from one of the



wards. It proved to be a hymn from a band of five Evangelists, two men and three women, who, without introduction or apology, were thus inflicting their sacred discord on the sick. For patients who might need perfect quiet, this was scarcely right treatment. The singers were requested by a nurse to desist, but their Quixotic zeal, we think, proves that they were not quite as 'wise as serpents' even if they be 'harmless as doves.'

"The library of the hospital contains some really profitable reading matter, but a large supply of good stories, travels, and cheerful books generally, would be a blessing to the inmates. No one can know, save by experience, how sweet an anodyne to the suffering and anxious is a cheery, interesting tale, written with the power which only great fiction writers possess of thoroughly absorbing the reader's attention. Complete sets of Dickens' and Thackeray would be so much mental medicine in such an institution. We looked in vain also for Shakspeare on the shelves. Books about concrete humanity, rather than abstract science, are what the sick man wants. The '*homo sum; humani nihil a me alienum puto*' of Terence, is perhaps never more realized than by a thoughtful mind on a bed of sickness. Suffering, like the one touch of nature, 'makes the whole world kin.'"

#### WATER SUPPLY OF OUR CITIES AND TOWNS.

At the suggestion of the President it was moved and carried, at the meeting of the Board in May, eighteen hundred and seventy, that the Secretary be requested to adopt such measures as he might deem expedient, for the purpose of procuring all necessary information respecting the introduction and distribution of pure potable water in all our cities and towns, and that he report to the Board, at his convenience, the result of his investigations, with such other information relating to this important subject as in his judgment he may think fit to make.

In response to this resolution he would now inform the Board that he had opened up a correspondence with the present water work companies and institutions for supplying San Francisco and other localities with potable water. No response has been received, except from A. W. Von Schmidt, President and Chief Engineer of the Lake Tahoe and San Francisco Water Works. From communications received from this gentleman, as well as the Secretary of the company, Geo. H. Ensign, it would seem that the initiative of a gigantic scheme had already been taken, the Truckee River already dammed below the outlet of Lake Tahoe, and preparations made for tunnelling the Sierra Nevadas, with the view of conveying the water of the lake to the head of the North Fork of the American River, and thence to conduct it to Auburn, Sacramento, Vallejo, Oakland, San Francisco and other localities. At the meeting of the Board on the twenty-sixth of August, eighteen hundred and seventy, the Secretary read the following letter respecting a qualitative analysis of this water.

SAN FRANCISCO, August 24th, 1870.

DEAR SIR: In accordance with your request, I send you a statement, in general terms, of the examination I made of the bottle of water from Lake Tahoe, that you sent me some time ago.

The water seems to be remarkably pure, and in its unconcentrated or undiluted condition gave no indications with the usual tests for chlorides, sulphates, or carbonic acid. It would not discolor the most dilute

solution of permanganate of potash, and gave hardly a perceptible film when evaporated to dryness in a small glass vessel, thus showing great freedom from *organic matter*. I also tested the water for metallic substances, poisonous and otherwise, with negative results.

I am, very truly, yours,

JNO. VANSANT, M. D.

A. W. VON SCHMIDT, Esq.,  
San Francisco, Cal.

After the reading of this letter the Board proceeded to examine a specimen of the lake water, which had been procured personally by the Secretary, and to apply such ordinary tests as are generally employed, when it was conceded that the water was remarkably pure, affording no indications of mineral or organic matters.\* The permanganate of potash test, however, was not tried at this time. On applying this test afterwards, in the manner recommended by Mahony, the Secretary became convinced of the presence of nitrogenous organic matters.

As it is well known that the water of Lake Bigler, now known as Lake Tahoe, is derived from the melted snow and springs of the surrounding mountains, it is highly probable that the specimen tested was not a fair one; the more so, when it is stated that the water was dipped up at about one hundred yards from the shore, where it had been more or less disturbed by boats and floats containing fishes. This important point will, however, soon be satisfactorily settled, as I am informed specimens from the middle of the lake have been sent East to be properly analyzed under the supervision of Professor Whitney.

From the remarks made during the examination of this water by the Board, it would seem that, owing probably to the difficulty of making analyses of water, the exact relation between impure water and disease does not stand on so precise an experimental basis as might be wished. This much, nevertheless, seemed to be established, that as investigations proceeded—and, indeed, in proportion to the care of the inquiry and the accuracy of the chemical examination—a constantly increasing class of diseases is found to be connected with impure water.

Apart from sanitary claims, the question of pure and impure water supply is a point of no mean importance, and even has a bearing upon health. For example: the expenditure of soap, from the use of hard water, is very great, and has been reckoned in London alone as equal to half a million sterling annually. This cost lessens cleanliness, and, in this way health is affected. In some manufactures soft water is so essen-

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\* In the beautiful blue color which it presents, when seen *in situ*, it resembles the waters of Lake Leman, Switzerland, which was said by Sir H. Davy to be "doubtless due to some compound of iodine." Dr. A. A. Hayes, Massachusetts State Assayer, gives an account in *Silliman's Journal* of some careful analyses of this water made by him. We quote: "A large volume of the water was mixed with a small portion of a diluted solution of sub-acetate of lead quickly and uniformly diffused. Another portion was treated in the same way, with a water solution of pure soap—both precipitates, slowly formed, were collected in a moist state, subsequently examined by the microscope, and were found to contain only the ordinary constituents of 'white' waters (colorless waters, containing lime salts in solution) when so treated. The negative results of these trials were sufficient to prove the absence of all coloring or colored bodies. Chemical analysis, thus conducted, having thrown no light on the cause of color in this water, we are led to ascribe the origin of its peculiar tint to natural influences, namely: the reflection and refraction of an azure sky in a colorless water."

tial for dyes and other work that great expense has been incurred to procure it. Even the question of good or bad infusion of tea is connected with good or bad water.

From such mixed sanitary and economical considerations the conclusion was arrived at, that the great question of potable water, involving that of engineering the water from our mountain lakes to our doors, must sooner or later be disposed of. Whether the water can be conducted through the American River, without being rendered too turbid and impure to answer the ends in view, so far as Sacramento is concerned, is a matter of very great doubt. If it cannot be, then we fail to perceive the advantage it would possess over the water of the Sacramento River, which is brought to our doors by natural channels.

As having an important bearing on this question, the following letter to the Supervisors of Sacramento County is here inserted :

#### RIVER AND WELL WATER.

*To the Hon. John Domingos, Chairman of the Committee on County Hospital :*

SIR : I herewith present the following report respecting the three samples of well water, numbered one, two and three, respectively, and submitted to me for an ex officio opinion as to fitness for the uses of the County Hospital :

Few sanitary subjects are deserving of more attention than that relating to potable water. Owing to its great solvent powers, water is never found perfectly pure in any place. In some mountainous and mining districts it holds in solution minute traces of the heavy metals, and in its course through the various strata of the earth's crust it, not improbably, sometimes obtains those salts arising from "fossil sewage" which, in the early geological ages, were deposited as organic matter. Certainly, in cities and towns whose water is procured from wells, it becomes contaminated more or less with impurities from the soil, from sewage, from house drainings and other channels of a like nature. In general, the impregnations acquired are not sufficient to give it any very sensible taste or odor to render it unfit for ordinary domestic purposes ; nor does the presence of chlorides, nitrates or sulphates necessarily prove, in all cases, defilement by the perfect decomposition and full oxidation of previous sewage contamination ; but to be declared absolutely safe for drinking purposes, water should be perfectly free from the minutest trace of nitrogenous organic matters, because the presence of the above mentioned salts, if accompanied by these matters, would indicate that organic substances were now actually being in an active state of decomposition when the water is in its most dangerous condition.

In order, therefore, to form an opinion of any value respecting any given water, the necessity of first obtaining an analysis, in accordance with the extended views of what deleterious impregnations imply, becomes obvious. For this reason I applied to certain experts in San Francisco for an analysis of the water in question, but finding the fee demanded (one hundred dollars for each specimen), although only reasonable altogether beyond your calculations, I proceeded, with the assistance of Mr. J. F. Rudolph, of this city, and the Rev. Dr. [redacted], who kindly volunteered his valuable services with the mission to subject the samples of water to such an examination as will,

I feel confident, answer all the practical purposes required. The following are the results:

Number one, specific gravity, 1,000.82 completely decolorized permanganate of potash in about twenty-four hours, when used in the manner recommended for the detection of organic matter by Mahony. The amount of fixed saline residue was seven and a half grains to the gallon of water.

Number two, specific gravity, 1,001.00 scarcely affected the permanganate color, and at the end of two weeks was but slightly changed. Amount of fixed saline matter, about the same as number one.

Number three, specific gravity, 1,001.51 completely decolorized the permanganate test in a few hours. Amount of fixed saline matter was equal to ten grains to the gallon.

The analysis being qualitative only, no attempt was made to isolate the various ingredients, but merely to ascertain the probable constituents. The tests used showed the presence of carbonic and sulphuric acids, and chlorine in combination with lime, soda and magnesia, and potassa as bases.

The specimens water were all clear, transparent and crystalline in appearance to the naked eye.

Submitted to the microscope, water number one exhibited traces of alga vegetation. The sediment insoluble in alcohol showed a saline deposit, chiefly chloride of sodium.

In number two, a few vegetable filaments, and also a broad film entangling spores of fungi were visible. The insoluble sediment was of the same character as number one.

In number three were plainly seen a small quantity of decomposing vegetable matter, also spores of algae, some free and others germinating. Some oscillatoriæ were alike discernable. Sediment same as the others.

From the above results we are led to the conclusion, that while the water of numbers one and three are sufficiently soft to be suitable for washing and bathing, they are neither (particularly the last) fit for drinking nor cooking. Not only would there be some risk of the mineral substances held in solution acting injuriously upon the stomach and kidneys, but the decomposing organic matters might induce such a state of the system as would aggravate every constitutional tendency to disease, and cause the inmates of the hospital to fall an easy prey to typhoid and other maladies of a low grade.

The water from number two is of considerable purity, and will compare favorably with that supplied by the Sacramento River. To afford some opportunity of comparison, I herewith introduce an analysis of the latter water, made in April, eighteen hundred and fifty-seven, by Dr. James Blake, now of San Francisco. One hundred and twenty ounces, taken from the river at the height of the freshet and evaporated to dryness, left a residue which weighed two and fifty one-hundredths grains. This consisted of—

Components.	Grains.
Sulphate of lime or gypsum.....	1.27
Sulphate of magnesia or Epsom salts .....	0.70
Chloride of sodium or common salt.....	0.21
Silicate of potash.....	0.13
Silica .....	0.25
Iron.....	a trace
Loss. ....	0.03
Total .....	2.50

From this analysis, which differs somewhat from the results obtained by us during the present very dry season, it would appear that the average amount of soluble material contained in our river water is but one part in twenty-three thousand. In each glass, therefore, only the eighth of a grain of saline constituents are present, and this small amount is almost absolutely inappreciable in its effects upon the animal system when unaccompanied by decomposing organic substances, as we find it to be. In fact, if these salts exert any effect, they are beneficial and not deleterious. From these statements, it would also appear that our Sacramento River water is even purer than that of the Mississippi River, which has a world-wide reputation for salubrity; for, in an analysis by Professor James Jones, of New Orleans, reported to General Baxton Bragg, I find he puts down the proportions of saline constituents in each glass of this water at half a grain.

While reprehending, therefore, the use of water containing an excess of mineral matters, I cannot but coincide with those sanitarians who affirm that water of moderate hardness, *ceteris paribus*, is always to be preferred to that which is entirely soft. So well satisfied are the French authorities of the superiority of hard water that they pass by that of the sandy plains near Paris and go far away to the chalk hills of Champagne, where they find water even harder than that of London, giving as a reason for the preference that more of the conscripts from the soft water districts are rejected on account of the want of strength of muscle than from the hard water districts, from which they conclude that the calcareous matter is favorable to the formation of the tissues. Nor would I object, from a hygienic point, to the suspended matters found in most of our river waters during a freshet, which, consisting chiefly of silicates and clayey matters, give that turbid appearance to which a general aversion is manifested.

I am pleased to be able to state that I am sustained in this opinion as to its harmlessness by Professor Jones. The "suspended matters," he states, "so far from rendering the water of the Mississippi River unfit for sanitary purposes, add to their disinfectant properties. The health of New Orleans would be, without doubt, greatly promoted by flushing out the main drains and gutters continuously with full streams of river water. The mud which would settle along the sides and bottoms of the drains would possess no noxious properties, whatever, of itself." This system was adopted while New Orleans was held by the Federal armies during the late civil war, and the city never was healthier.

Reviewing the whole subject, in all its bearings, I would recommend

you to look rather to the supply of water for the hospital ultimately from the river, when the Holly system of filtering and distribution shall have been perfected, than the precarious supply of water from the wells, however pure it be shown to be by analysis at any one time. Seasons, and a variety of other circumstances, as has just been stated respecting our river water, do certainly produce effects at certain times that may not exist at others. The water of any locality might be deemed harmless at one time, and soon after the same water, although containing but a minimum of organic matter, may be found to possess organized matter of such a deleterious nature that our ideas of the most virulent substance fall short of the horrible results that these invisible poisons can accomplish. From the absence of proper drains, refuse poured upon the ground may infect water just as it does air. In some instances the kitchen slops, delivered from a spout upon a limited space, have, in the course of time, worn a direct channel to the family or neighboring well. In any case, it must be remembered that the soil surrounding a well is drained by it. It is stated by high authorities that the soil and sub-soil surrounding is drained by it, and that the extent of the drainage may be represented by an inverted cone, of which the base at the surface of the ground is equal to from one to three times the depth of the excavation, this difference depending on the porousness of the earth.

From this it will be seen how important it is that pigsties, privies and manure heaps should be kept at a certain distance from habitations of all kinds. Many a case of impaired vitality, ready to succumb to trifling ailments, might be traced to such pollution. The disinfecting quality of earth itself fortunately relieves us from this greatest liability to impure well water; but even this beneficent quality may be exhausted by abuse. In certain localities, near the borders of rivers, wells sunk in the beds of sand and gravel yield good water, which percolates through from the river; but a few feet will frequently alter the character of the water entirely. For this reason, too much thoughtful care cannot be given to the construction of the proposed wing-dam cistern in the bank of the Sacramento River, in carrying out the Holly system of supply. All of which is respectfully submitted.

THOMAS M. LOGAN, M. D.,  
Permanent Secretary State Board of Health.

SACRAMENTO, September 12th, 1870.

#### SANITARY ARCHITECTURE OF PRISONS, HOSPITALS, ETC.

At the meeting of the Board, on the twenty-fifth of November, eighteen hundred and seventy, the Secretary informed the Board that his attention had been called to the manner in which the cells in the new county prison, in Sacramento, were being constructed, and that, in his official capacity, he had indited the following communication, which would apply generally to all similar institutions, as well as hospitals, asylums, etc.:

\* The following communication from the Secretary of the State Board of Health was read and referred to the Committee on Public Buildings:

*To the Honorable Board of Supervisors of Sacramento County :*

GENTLEMEN: My attention has been called, as the Executive of the State Board of Health, to the newly erected county prison, and especially to the iron cells therein, by disinterested parties, influenced wholly by humane considerations. It is to be regretted that neither the City nor State Boards of Health were consulted previously to the construction of this portion of the County Court-house, as I have reason to believe that, with the same amount of outlay, the work could have been done much more in accordance with the recent advancement of the sanitary architecture of hospitals and prisons. It is too late now to remedy all of the defects resulting from this want of foresight; some of the most obvious only can be modified, and to these I beg leave to call your prompt attention.

I refer, in the first place, more particularly to the iron cells. The walls, ceilings and floors of these being made entirely of sheet iron, will cause a condensation of the moisture of the atmosphere thereupon, which, trickling down upon the floors, must add to the conducting power of the iron upon the prisoners' feet. This must create a degree of suffering from cold, of which we, who have the benefit of exercise, and warm carpets to put our feet upon, can form no conception. The remedy is to be found in well-seasoned pitch pine floors, thoroughly saturated with beeswax and turpentine, so as to prevent the absorption of water; and the joining should be so perfect that no fluid may pass through and collect below the floor. Or, what perhaps will answer better, thick lattice-work floors or wooden gratings of the same material, may be constructed in sections, so that they can be taken out occasionally, when the underlying iron floor should be swabbed and dried. The reason for my recommending that the floor should be made of pitch pine (oak is better) is because of its capability of absorbing but a small quantity of water, and it is very desirable to diminish even that capability, by saturating it with beeswax and turpentine—the former being an unalterable substance. This flooring can be cleaned, like the French *parquet*, by *frottage*. A hospital or prison floor should never be scoured. A very good floor for such buildings is that used in Berlin, which is oiled, lackered and polished so as to resemble French polish. It is wet and dry-rubbed every morning, which removes the dust. Both processes render the floor non-absorbent—both processes do away with the necessity of scouring altogether. The reason why frequent scouring with water is hurtful is because the subsequent evaporation carries up organic matter, and erysipelas and other diseases have been proved to have been thus rendered frequent.

The next defect, to which I would call your attention, is found in the rough plank and brick walls surrounding the cells. These have been whitewashed; but, to be effective for the removal of carbonic acid, this must be renewed at least every three or four weeks, and I am doubtful if that gas is the most noxious constituent of foul air. Ordinary plastered walls become, in a few years, loaded, as experience has shown, with deleterious organic matter most abundantly. What is wanted is an impervious material, capable of receiving a polish on a white or tinted surface, that can be washed frequently with soap and water without its being absorbed into the substance. The iron walls and ceilings of the cells, if properly painted and varnished, will meet all the requisitions in this respect.

These are the most important defects in the construction of the prison,

that are susceptible of rectification; and you will pardon me for obtruding my advice, when you consider that it is incumbent on me so to do. The law of the last Legislature says, "the State Board of Health shall act as an advisory Board to the State in all hygienic and medical matters, especially such as relate to the location, construction, sewerage, and administrations of prisons, hospitals, asylums and other public institutions." \* \* "Their Permanent Secretary shall reside at the Capital, and shall be their executive officer." In the discharge of my functions, therefore, as already stated, this communication is respectfully tendered.

Your obedient servant,

THOS. M. LOGAN, M. D.,  
Permanent Secretary State Board of Health.

SACRAMENTO, October 14th, 1870.

Dr. Montgomery suggested the propriety of following up the subject of hospital architecture by communicating with the authorities of the different County Hospitals and advising with them respecting the administration of these public institutions. The year was now drawing to a close, and it was desirable to procure the annual reports of all, or of as many of them as possible, for the information of the Board. In his opinion most of the hospitals were constructed without any regard to the first principles of sanitary science, such as provision for ventilation, light and pure water, and were administered in a loose, speculative spirit, whereby the care of the poor and the sick was sold out to the lowest bidder. In continuation of this subject at a subsequent meeting of the Board, on the twenty-fourth of February, eighteen hundred and seventy-one, Dr. Montgomery said, that being on the Committee of Public Institutions, of which Dr. Stone was Chairman, he would again suggest that a circular be addressed to the Supervisors of every county in the State, requesting information respecting each County Hospital, and, if possible, a detailed report of the past year's transactions, especially with regard to the number of patients received in the hospital, the number discharged, and the number who died, together with a statement of the diseases and accidents.

The Secretary replied, that having been constituted *ex officio*, a member of all the standing committees, he had during the past month opened up a correspondence with all the different county officers of the State, with a view of obtaining statistics respecting marriages, births and deaths, as well as respecting the sanitary condition of all public institutions. Some of the County Physicians had already responded respecting the hospitals under their charge, and as doubtless all would report in due time, he trusted that any further action at present would not be deemed necessary. With permission, he would now read one of the responses, just received from Dr. S. D. Campbell, Physician to the Solano County Hospital.

*Description of Solano County Hospital and its appurtenances, by S. D. Campbell, Physician.*

The main building is a weather-boarded house, thirty by twenty feet, divided into three wards, viz: first ward, twenty by sixteen feet; second ward, fourteen by twelve feet; third ward, fourteen by eight feet; height of ceiling, in each ward, ten feet.



In those three wards there are twelve cots and two bedsteads; each cot or bedstead is furnished with one straw mattress and pillow, one pillow slip, two sheets, two blankets and one bed cover, one small table, placed between the beds for patients' medicines, one night stool and an ample quantity of chambers and spittoons.

The dining room, joining the building, is twenty by eleven feet, in which are twelve chairs, one dining table, eleven by three feet, covered with oilcloth, one stove, and one closet for dishes.

The dispensary is stocked with drugs and surgical instruments too numerous to mention.

There is also a wash room, on the north end of the building, nine by seven feet, for the patients, with two wash basins, one wash tub, one comb, one looking-glass, and each patient is furnished with a towel for their individual use.

*Quarterly report of patients in the Solano County Hospital, commencing November 9th, 1870, and ending February 8th, 1871, together with date of admission, discharge, deaths, etc.*

No.	Names.	Date of admission.	Date of discharge.	No. of deaths	Diseases, etc.
1	John Olliver.....	November 9, 1870..	.....	none.	Paralysis.
2	John Daley.....	November 9, 1870..	.....	none.	Paralysis.
3	John Dean.....	November 9, 1870..	February 6, 1871..	none.	Fractured leg.
4	H. W. Lambert.....	November 9, 1870..	.....	none.	Paralysis.
5	Lawrence Fitzpatrick.....	November 9, 1870..	November 18, 1870	none.	Chronic dysentery.
6	John Smith.....	November 9, 1870..	.....	none.	Intermittent fever.
7	Frederick Nanick.....	November 9, 1870..	November 29, 1870	none.	Intermittent fever.
8	Henry Baker.....	November 9, 1870..	November 13, 1870	none.	Phthisis.
9	John Murdock.....	November 12, 1870	December 6, 1870..	none.	Fractured arm.
10	.....	November 12, 1870	January 26, 1871..	none.	Syphilis.
11	Michael Nolan.....	November 18, 1870	December 9, 1870..	none.	Sprained ankle.
12	Jeremiah Taber.....	December 2, 1870..	December 7, 1870..	none.	Bruised hand.
13	Peter Edgworth.....	December 3, 1870..	January 9, 1871 ..	none.	Rheumatism.
14	Asia H. Norton.....	December 7, 1870..	.....	none.	General debility.
15	Timothy Conness.....	December 24, 1870	February 6, 1871..	none.	Intermittent fever.
16	W. I. Wright.....	January 13, 1871..	.....	none.	Paralysis.
17	David Dickey.....	January 14, 1871..	.....	none.	Intermittent fever.
18	John Kelly.....	January 15, 1871..	January 25, 1871..	none.	Catarrh.
19	James Cook.....	January 21, 1871..	.....	none.	Paralysis.
20	David H. Jones.....	January 21, 1871..	.....	none.	Hemorrhage lungs.
21	.....	January 30, 1871..	.....	none.	Syphilis.
22	.....	February 1, 1871..	.....	none.	Syphilis.

Number admitted.....	22
Number discharged.....	11
Total number remaining.....	11

Upon the reading of this communication Dr. Montgomery expressed himself perfectly satisfied to let the further action, he had anticipated taking, drop altogether. This was, to transmit written instructions and recommendations respecting the construction, arrangement and administration of the County Hospitals to the proper authorities throughout the State, but he now thought that if the hospital report just read was published it would serve not only as a model for the guidance of other

reporters, but also for instruction as to all the requisites of a well-conducted hospital.

#### SACRAMENTO COUNTY HOSPITAL.

The Secretary would in this connection call attention to the fact that a new and imposing structure for a City and County Hospital has recently been erected, about three miles from Sacramento, at a cost of some eighty thousand or ninety thousand dollars. The exterior of the building, which is of wood, presents a fine appearance, and possesses some architectural merit, notwithstanding it is not strictly in accordance with the latest well-established principles of hospital construction. It is in the main two hundred and seventy-four feet long, and in the greatest width fifty feet, not including an L addition, which is sixty-five feet deep. The centre section has four stories and the other sections three stories—the basement story being eleven feet in height, the second story eighteen feet, and the third sixteen feet. The roof is finished with large dormer windows, and bears five tanks, capable of holding one thousand three hundred gallons of water each, which is elevated by an engine of six-horse power, from an artesian well. Each story is surrounded by firm and substantial piazzas, and well lighted, and, so far as windows are capable of doing, ventilated.

There are six wards, each in size one hundred feet by twenty-five feet, with bath rooms, supplied with lavatories, hot and cold water, sinks and water closets. In each ward there are two good radiating fireplaces, which, with its magnificent supply of windows, will afford, in the absence of any other artificial means of ventilation, a good supply of fresh air.

On the first floor, to the right of the main entrance, are the physician's office and operating rooms, and opposite to this are the dispensary and other necessary offices. In fact, all the modern appliances and conveniences necessary for carrying on successfully such institutions are provided in abundance; while the internal administration, under the supervision of the Visiting Physician, Dr. A. C. Donaldson, and the constant attention of the Resident Surgeon, Dr. G. A. White, appears to be well ordered.

In the yard, besides the engine house, there are all the requisite out-houses belonging to such institutions; also, two gas tanks, capable of holding two hundred gallons of gasoline, with which the house is supplied.

The grounds, consisting of sixty-five acres of the most fertile character, are eligibly located, and would render the establishment all that is desirable for an almshouse; but for the purposes of a City and County Hospital the whole institution is a wilful blunder. All the physicians of Sacramento, with one solitary exception, protested against the site at the time it was purchased by the Supervisors; but notwithstanding, these authorities, in the exercise of their plenary powers, proceeded and erected the structure just described, without consulting one solitary physician, and regardless of the expressed wishes and opinions of the County Medical Society. In consequence of this action on the part of the Supervisors, all the charitable societies of Sacramento are overburdened with the sick and destitute, who have not the means of paying for transportation to such a distance at the inception of their disease, and of course cannot afterwards be removed without danger. Consequently, the spacious hospital that has been erected at a great cost to the county

never more than half filled with the patients. It is a matter of common sense. To provide against another such gross violation of the rights of physicians, who are the proper guardians of the public health and who best know what the requirements of a hospital are, are these measures made.

According to the acknowledged authority of the glorious Florence Nightingale, the elements which ought to determine the position of a hospital are the following: First, and before all others, purity of the atmosphere; second, the possibility of securing the best and nearest to it, third, accessibility for medical officers and the friends of the sick.

All of these elements are of importance, and one is as much as a necessity of no use to build a hospital in the best air in the world, if medical patients nor medical officers can get to it.

The only possible advantage that can be claimed for the present location of the Sacramento Hospital consists in the greater purity of the country over the city air. But even this position cannot be maintained, inasmuch as the rate of mortality during the last six months since the occupation of the suburban hospital far exceeds that of the year prior to the present.

As stated in the table of results of charitable hospitals, it was eleven and six tenths per cent. in the old hospital, whereas in the present one it is found to be fifteen and two tenths per cent. This increased rate of mortality is undoubtedly to be attributed to the fact that, owing to the inaccessibility of the new hospital, most of the cases transported there are of the gravest character—the latter cases of sickness, which go to make up a more favorable showing, preferring not to be treated at such a distance from the city.

#### SACRAMENTO HOSPITAL.

This noble monument to the provident humanity of the Directors of our great railroad, is situated in Sacramento, at the corner of Thirteenth and O streets, and resembles, in every respect, the Sacramento County Hospital, just described, except that it is a little less capacious. It contains ten private rooms for the sick and six large wards, the latter capable of accommodating temporarily eighteen patients each, and the whole hospital about one hundred and twenty, exclusive of nurses, help, etc. Up to the present time, however, the largest number in the building at any one time has been forty-eight. The present building and grounds cost the company about sixty-four thousand dollars. The maintenance requires about one thousand six hundred dollars per month, which is nearly covered by the hospital tax of fifty cents per month, paid by all the white employees, who alone are admitted.

Notwithstanding the same defects as to ventilation, warming and large wards, in which a number of the sick are placed together, the death-rate is unacceptably small, (only two per cent., as shown in the table of results of charitable hospitals), reflecting great credit upon the skill of the physician, Dr. A. B. Nixon, and establishing this hospital as first in the order of celebrity and successful results in the world. Doubtless the extremely low death rate is due to the fact that most of the cases are of a non-acute character, and that while a very small proportion are of dis-ease of an acute nature, there is no crowding, because of the small proportion to the capacity of the wards, at any one time in the hospital. These results speak loudly and irrefutably in favor of a liberal allowance of cubic space per bed and moderately filled wards.

## REGISTRATION OF MARRIAGES, BIRTHS AND DEATHS.

At the meeting of the Board on the twenty-fifth of November, eighteen hundred and seventy, a long and desultory discussion occurred, in which most of the members took part, in consequence of a statement made by the Secretary showing the incompleteness of the returns, especially of births, even in San Francisco, where heavy penalties are incurred from neglect of this duty, by those upon whom it devolves.

The President thought that the main difficulty consisted in the long array of interrogations required to be filled out in the certificates. This intimidated a lazy man from undertaking the trouble of responding to any of them.

The Secretary replied that it was not expected, nor was it absolutely obligatory to respond to all the queries propounded, although it was very desirable to have them all answered categorically as far as possible. Independently of the very great advantage which the State would derive from a complete system of registration within her borders—the ability to determine clearly and distinctly the relative fecundity and mortality of her population—the relative proportion of the sexes among her citizens—the longevity of her people—the causes of death, and the weight with which each cause of death presses upon different portions of the community, whether those portions be considered in relation to age, sex, or condition of the people, or in relation to different sections of the territory, and of many other benefits, it is highly proper and necessary to be able to compare all these facts with those of other States or countries. In this way it may be ascertained what differences exist, and why those differences do obtain; what diseases prevail more extensively in our State than in another, and why. But to make this comparison correctly and with satisfaction, it is necessary that the basis upon which these reports from different States are made, should be essentially the same. Hence he had endeavored to initiate the uniform plan recommended by our National Medical Association.

The President replied that he was satisfied respecting the importance of all the facts sought to be obtained in the framing of the birth and other certificates—their completeness being wholly in harmony with the great purpose of life saving. He only regretted to see so little of the right spirit manifested in facilitating the unity of design contemplated by the forms and headings for the records and blanks prepared for registration. He thought that as the Secretary had or will have considerable experience in the working of the plans of registration, already inaugurated, the Board might safely leave the matter in his hands to make such suggestions and recommendations, respecting a general registration law, to the Legislature, as in his judgment might seem practical and proper.

[See article at the conclusion of this report, headed "Draft of an Act relating to a registry and return of births, marriages and deaths, and for establishing Local Boards of Health, and for other sanitary purposes."]

## CONSUMPTION AND A SANATORIUM.

Reverting to the proceedings of the meeting of the twenty-fourth of February, eighteen hundred and seventy-one, the President called attention to the great mortality by consumption pointed out in the monthly reports, published by the Secretary, in the "Pacific Medical and Surgical Journal." He said it was time for the Board to commen-

gation of the subject of the prevalence of consumption in our State, and to ascertain to what extent climate has to do with its fatality. Doubtless a great number, dying here, have brought the germs of the disease with them, under the general opinion that a trip to California would prove beneficial, and without considering that it was necessary to find out what modification of climate, caused by locality, was best adapted to the particular stage and character of their disease. As was well known to the Board, in no part of the world was there such a variety of climate to be met with as within the boundaries of the State. There were in the southern parts of California localities where the climate would compare favorably with that of Italy, or the south of France, where thousands of invalids flock each year in pursuit of health. He had recently heard of a medical delegation being sent here from Chicago, for the purpose of selecting a proper site for a sanatorium, and he thought it would be but right that the members of the Board should take this matter into their own hands, where it properly belonged.

The Secretary remarked that from what he had heard of the evenness of the climate of Santa Barbara, he was disposed to regard it as well adapted to that pretubercular stage of phthisis, when there exists an abnormal sensitiveness to sudden atmospherical vicissitudes, and disorder of the digestive organs ushers in the cachexia. There, it would seem, the patient need not be confined in a glass hothouse, but bask in the genial sunshine out of doors, and take all the exercise needed for the healthy action of every function, without that danger of the morbid degradation of the physical constitution which is superinduced by a long residence in southern latitudes.

The deliciousness of the climate is indicated by the readings of the hygrometer. From some meteorological observations lately received, it would appear that the range between the wet and dry bulb thermometers at two o'clock P. M. is usually about four degrees, except on foggy and rainy days, when it is sometimes identical. During the prevalence of a high warm wind, the range is extended, at times, to ten, or even twenty degrees. But this does not happen oftener than two or three times a year, and then only for a short period—usually about the time of the vernal and autumnal equinoxes.

[A fuller account of this locality will be found in the subsequent portion of this report, under the head of "Topography and Meteorology."]

#### THE CHINESE AND THE "SOCIAL EVIL" QUESTION.

At the meeting of the Board on May twenty-sixth, eighteen hundred and seventy-one, the Secretary reported as follows:

It is a notorious fact that the Mongolian portion of our population are totally regardless of all sanitary laws. From this consideration, if no other, the Chinese question imperiously demands attention at our hands. Consequently, he had indited a letter to Dr. A. B. Stout, of San Francisco, who, as is well known, has given studious thought to the subject, invoking his services, for the good of the State, in the discussion of the various points involved in a hygienic point of view. This letter, a copy of which is herewith presented [see Appendix, page fifty-four, introductory to Dr. Stout's response], explains fully the reasons for making the application to a disinterested party, and opens up the topics on which special information is most desirable. He was happy now to be able to state that the Doctor had not only replied most satisfactorily, and en-

gaged to furnish a response in time for our report to the Legislature, but had also kindly proffered a valuable State paper on another equally important subject, known as the "Social Evil." This last paper [see Appendix, page forty-four], was prepared at the instance of a member of the Legislature of our sister State, Nevada, but not being ready in time for the action of that body, who disposed of the question in the negative, was read before the Section on Hygiene, at the late meeting of the American Medical Association in San Francisco, and received the indorsement of that body, with a recommendation that it be appropriated to the use of the State Board of Health of California. The Secretary would premise that the paper repudiates the doctrine of the permanent necessity of prostitution, and consequently of legalizing by licensing it. It inclines to meting out the same measure of condemnation to both sexes, for like offences committed by either; and instead of regarding outcast women as slaves, to be disciplined and duly qualified by the State to minister to man's sensuality, insists upon treating them as human beings, whose physical sufferings and moral degradation constitute an especial claim on our sympathy and charity. No abandoned woman chooses, of her own volition, her mode of living. She is impelled to it in ignorance, or driven to it by destitution. Her only protectors are her innate sense of modesty and love of virtue, together with her natural pride of high social position. When these sentiments are highly educated, her power of self-protection is increased; as they are neglected, her defences are weakened. If this be true, it is plain that direct coercive legislation can avail but little; and a State that would condescend to draw a profit from the evil, either in the form of punishment or to reimburse expenses, becomes *particeps criminis*. We must, therefore, look to education, and the cultivation of liberal Christian sentiment, as the only true and successful method of promoting human ennoblement, and thus of securing that physical and moral health, which, "while incompatible with abusive indulgence of the sexual nature, is the only indispensable condition of truly vigorous individual life, and therefore of permanent national strength and greatness."

The President here expressed himself to the effect, that inasmuch as the Board had not been directly called upon for an expression of opinion or advice by the authorities, as to the evil in question, it would look like officiousness, on our part, to thrust the matter before the Legislature, especially as there was no positive remedy proposed. He, moreover, did not like the form in which it was submitted.

The Secretary replied that in his opinion, it mattered but little in what form the truth was presented to the intelligent mind, provided it involved a principle of usefulness and moral advancement. Here is a case brought to our notice, and evidence adduced, proving that the diseases associated with prostitution are widely spread throughout the Pacific States, and producing a profoundly degenerative influence on the physical life of the people. Among the social problems, which the most eminent philanthropists and statesmen, in every part of the civilized world are discussing, this—How may prostitution be controlled?—stands foremost; and, together with that subordinate one, related to and grouped with it, in the present discussion, viz: the Chinese question—urgently demands our most careful and official attention. And, although it is true that the governmental experiments which have been made in Europe, with a view of exercising a sanitary influence on prostitutes themselves, have been attended by one and the same result—total failure to accomplish the object intended—must we be content to

abide by the conventional agreement of society, and not speak on the subject? I believe not. Without abandoning altogether the coercive policy, especially as regards the Mongolian portion of our population, let us at least prove faithful to the reformatory idea of appealing to reason, and to the love of the noble and the beautiful, existing, either latent or more or less developed, in the Caucasian race.

The Secretary now proceeded to narrate an account of a midnight visit made by him to the Chinese quarter, in San Francisco, on the eighth of May, in company with Dr. Storer, of Boston, and Dr. McNutt, of San Francisco. Through the polite attention of the Medical Health Officer, Dr. Bates, who also accompanied us, an arrangement had been made with the Chief of the Police for a special officer to accompany us, who was familiar with the haunts and habits of the denizens of this portion of the city. We visited the lowest dens of degraded bestiality, and soon became convinced

"That for ways that are dark,  
And for tricks that are vain,  
The heathen Chinese is peculiar."

Most of us are familiar with the crowded, filthy, and abominable condition of Chinese life in California; but none who have ever witnessed the midnight orgies of this hebetated people in San Francisco, can imagine the depths of depravity into which they are sunk. "Down many a winding step to dungeons dark," we followed our able conductor, sometimes in Indian file, sometimes stooping—almost creeping through foul labyrinthine passages. Every now and then these dark passages would open into dimly lighted rooms, wherein were to be seen dusky human beings, lying on tiers of broad shelves, like the berths of a ship, each with a foul opium pipe, and dirty little oil lamp used for lighting the pipe at his side. At times we would encounter the daughters of the "flowery land," each sitting, or standing, in a little tawdry room, or rather box, and, with painted lips and rosy-tipped fingers, beckoning us to enter. Suddenly we would light upon a gambling saloon—for John Chinaman likes the excitement—and then there would be a variation in the deep monotone of their stolid life, caused by the hurry and scuffle to conceal what they were about.

We entered and inspected one of the large lodging houses. In the dimly lighted passages were seen, occasionally passing and repassing, young and old, male and female, apparently peering at us, intruders on their private premises. In the rooms, which were cut up and divided into what might be called pens, were observed the half naked forms of the same kind of inmates already encountered in the underground rooms, reposing on shelves—some sleeping, others blowing out curling puffs of narcotic fumes from their broad, brutal nostrils, just like the old opium-smoking hag in Dickens' "Edwin Drood," and which affords so graphic an instance of civilization touching barbarism—extremes meeting. What surprised us most, was the little apparent commingling of the men with the women, and the infrequent evidences of syphilitic disease; both of which facts are doubtless to be attributed to the sparseness of the females. Certainly, so far as the Chinese portion of our community are concerned, there appears to be no call for the enactment of laws for the suppression of the so-called "social evil." A physiological feature, worth noticing in this connection, is the frequent epilatory condition of the genital organs, especially among the females, which, like the not uncommon defect of beard in the male, rather indicates the absence of strong or enduring sexual appetite.

I have not yet spoken of the greatest infringement of the laws of health to be met with in the Chinese quarters, and which calls for immediate redress. I allude to the almost absolute absence of ventilation. In the underground purlieus there is no means whatever for the admission of air, save through the common cellar opening or entrance. The domiciles above ground are no better, because the windows are too few and small in proportion to the occupants, and besides they are never left open. The consequence of this is that the stench of the premises is horrible. We felt ourselves enveloped in a physical atmosphere as tainted and disgusting, from superadded stale opium smoke, as the moral one was degraded.

Of course I could not well refrain from expressing my astonishment that the city authorities would allow even one such den of filth to taint the atmosphere, both physically and morally, of the whole neighborhood. It is very plain to my mind that were it not for the strong oceanic winds which prevail during the summer months, San Francisco would, ere this, have suffered the heaviest penalties for such gross violations of every sanitary law. But this is not all the guilt involved in this view of the Chinese quarters. Our guide informed us that to just these places, reeking with abominations, men—white men—of apparent respectability, go and lose their manhood and their money, and then come shamelessly to the police to aid them in regaining some bauble that may have been stolen by their Mongolian paramours. And worse than this, most of these abodes are owned by *gentlemen* of high social position—members even of Christian churches—and who, either themselves, or through some paid agent, receive the wages of sin and corruption. It is high time that public opinion should be brought to bear upon such nuisances, and cause their speedy abatement.

To show that I am not coloring the case too strongly, I will here quote briefly from a statement, published in the papers not long since, of a deputation to the San Francisco Board of Health, from the Anti-Coolie Association: "Some houses have five hundred lodgers—some one thousand; and in the Globe Hotel—standing on ground sixty by sixty, and three stories high—there are twenty-five hundred tenants." In some places they say Chinamen have burrowed dens, even beneath the streets, holes that would "not admit a coffin. There are innumerable subterranean dens where gambling is carried on, and where crimes that cannot be named are habitually committed." They add that the Chinese here carry out their laws independently of ours; they hold subterranean Courts, have Judges and executioners, and inflict the death penalty on any of their race who may reveal their secret doings to the Americans. In conclusion, the deputation prays the Board to interfere, and prevent at once a threatened fatal epidemic and a violent popular outbreak.

Of course the State Board of Health are only so far concerned in this question as it relates to the public health. Any interference beyond this, or suggestions apart from hygienic considerations, would be an act of supererogation on our part. But believing, as I do, that the Mongolian type of humanity is an inferior type—inferior in organic structure, in vital force and in the constitutional conditions of full development—it appears to me to be incumbent on us to gather and direct into one focus all the light we can, that has even a remote bearing on the momentous question of public health.

I know not what line of argument Dr. Stout (to whom, as just stated, I have applied) will adopt in this discussion. Some years ago he expressed his apprehension of a debasement of the American race-types by intermixture with the inferior race. At that time there was reason



to fear that California would be overrun by the hordes of Asia. Since then the tide of immigration has slackened in this direction. Possibly the Doctor may now modify his extreme views. But treat the subject as he may, so he meets the questions I have propounded in my letter to him, we cannot fail to receive some valuable suggestions, worthy of being submitted to the Legislature. For my part, whatever of truth there may be in Darwin's theory of natural selection to the contrary, I am not one of those who fear that an intelligent people, like ours, would run any serious risk of race degradation from intermixture with the Chinese. Our experience, as a nation, is already valuable on this point, and goes to show that although we have been brought continuously into close relations with the Indian and the negro, still the elements of assimilation have proved too discordant to permit any permanent intermixture with either of these peoples. The negroes number about one-tenth of the population of the United States, and yet the fact of miscegenation has been but local, and even then so partial as to be quite inappreciable. Still, the presence of the negro race in our Southern States has been the *casus belli*, and other deplorable troubles, which we are not likely soon to override. In the Spanish colonies on this continent, the European (Latin) race mingled, as is well known, with the Indian and the African; and we need nothing more than the present history of Mexico and Central America as an instructive commentary on the fact.

#### ACTION OF THE SECRETARY SUSTAINED.

Dr. Montgomery expressed himself as pleased to learn of the action that had been taken by the Secretary in carrying out the objects for which the Board had been created. He thought it was perfectly legitimate to discuss just such questions as have now been sprung. The State looks to us, as the guardians of the public health, for the light of every species of information bearing on the subject. Be it ours to furnish the supply from every available source. From what he had gathered of the tenor of the paper alluded to in the Secretary's remarks, it seemed to possess peculiar claims to our consideration—in fact, it was just such a document as should receive the indorsement of the Board. Harmonizing with our views, it philosophically indicates the causes which may ultimately co-operate in annihilating prostitution, without violating any principle held sacred by moralists, political economists or statesmen, and without outraging the feelings or interfering with the personal liberty of prostitutes themselves.

Dr. Todd remarked that he was satisfied that the course pursued by the Secretary, in the matter under discussion, was perfectly correct and proper; he, therefore, would make a motion (which was carried) that the Secretary be authorized to incorporate, in his report to the Legislature, such paper or papers relevant to the Chinese and social evil question as in his judgment seemed expedient.

#### OFFICIAL VISIT TO SOUTHERN PARTS OF THE STATE.

The Secretary informed the Board that he had been occupied of late in visiting several localities in the southern part of the State, noted for ~~suburbity~~, as San Rafael, Santa Cruz, Monterey, San Luis Obispo, Santa Barbara and other places.

At the former place opportunity was afforded, through the politeness

of Dr. A. W. Taliaferro, the physician in charge, of visiting the State Prison, at San Quentin, and verifying his report, which will appear among the other hospital statistics. While most of the localities named are possessed of climatic elements adapted to different stages and characters of pulmonary diseases, that of Santa Barbara appeared to present that happy combination of the tonic and sedative climate which would seem to render it suitable for a greater variety of phthisical affection, and at the same time better adapted to the different stages of the cachexia than any other one place visited. For this reason he had pronounced it the most fitting point for a *Sanatorium* in California. Accordingly, he had prepared and published in the *Rural Press* and *Scientific Press*, for the purpose of diffusing more general information on the subject, a popular account of those leading features of the prevailing atmospheric constitution of the place, as modified by the physical conformation of the country, and which go to make up what is here understood by the word climate. Doubtless there are other points in the southern portion of the State as, for instance, Los Angeles and San Diego, which he had not visited, and which may be equally as well adapted to certain stages of phthisis, but he could not speak from personal experience, and could only refer to the meteorological and other statistical data, which have been promised in time for our report to the Legislature.

#### VITAL STATISTICS.

Allusion has already been made to the extemporizing of a general plan, in accordance with such methods as the principles of sanitary science have established, for the purpose of ascertaining the death rate in the State. In order to give the Board some knowledge of the present manner of collecting and compiling the requisite statistics, I will state that a number of circulars, blank forms and schedules, etc., are sent out from our office addressed to physicians, County Clerks, Recorders, and the officers of the different charities, hospitals, prisons, and other institutions; in fact, to all from whom it is deemed possible that any information might be derived bearing upon the subject in hand. Correspondence connected with the filling out of the blanks comes to hand daily. Some unskilled reporter wants information on some point, and another on some other question. Orders for blank schedules are continually being received, notwithstanding the system which was inaugurated, of transmitting them at regular periods. Then some of the reporters fail to acknowledge the receipt of the blanks, and further correspondence is required to make sure that they would have them in time. When the returns have been received, letters have to be written to correct errors, and make plain some imperfectly returned birth or death. These difficulties and impediments have embarrassed our operations to such a degree, that it was found necessary to relinquish some of the means resorted to and confine our attention more particularly to the mortality reports from medical sources. The justness of this conclusion will be manifested on an inspection of the tables embodying the returns of births and marriages.

Statistics of many years, and of many healthy countries, give as an approximate estimate of the number of births in a total population, one birth to every twenty-five to thirty-five inhabitants. The birth rate in Boston is one to every thirty-three and seventy-hundredths persons.

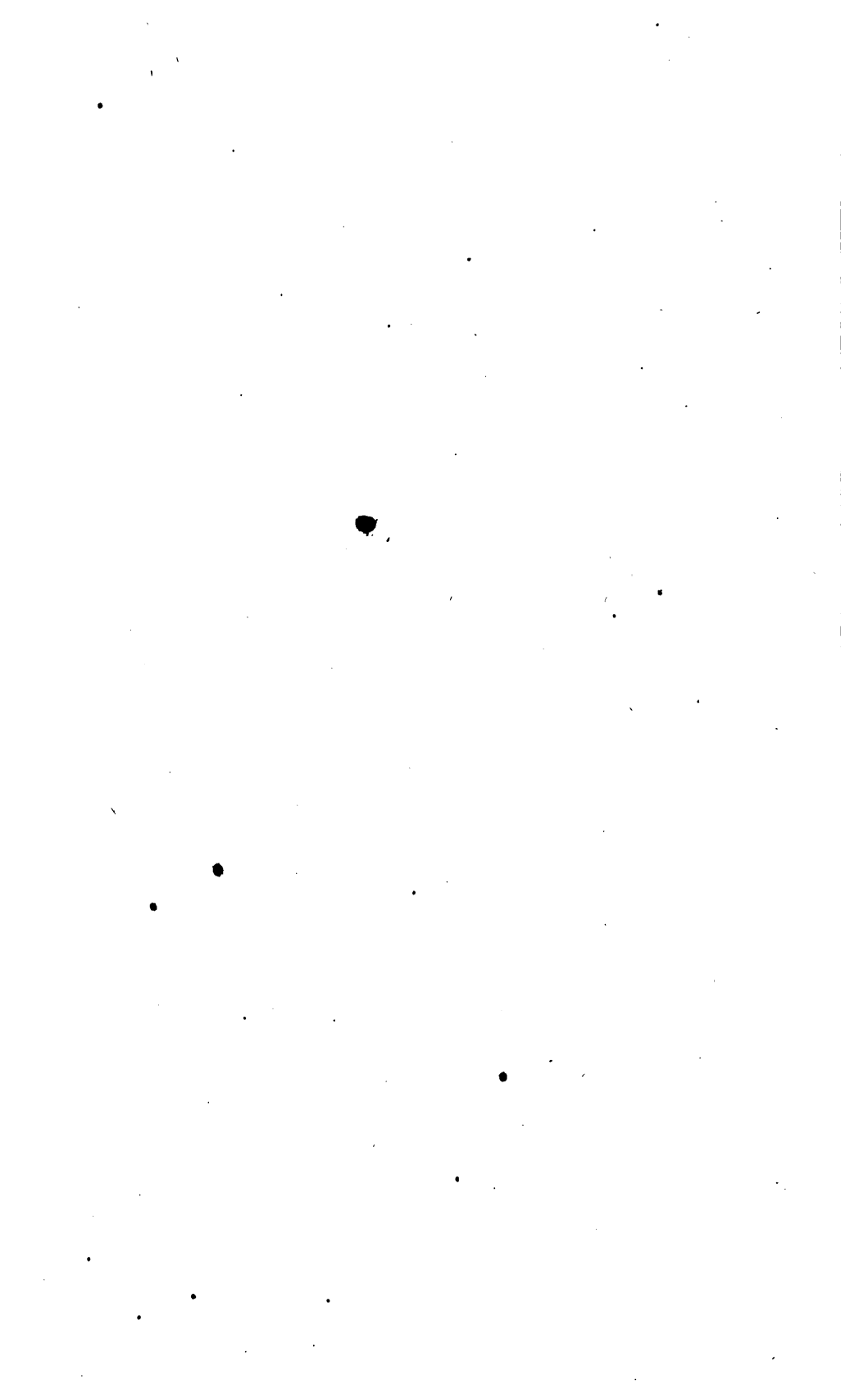
TABLE

*Exhibiting, by Counties, the number of Marriages, so far as reported, for the year 1870; also, the Nationality of the Couples and the relative Nationality of the Sexes.*

COUNTIES.	Whole number...	NATIONALITY.		RELATIVE NATIONALITY			REMARKS.
		American ...	Foreign.....	Amer. males For. females	For. males... Am. females	Not stated...	
Alameda.....	.....	.....	.....	.....	.....	.....	No returns received.
Alpine.....	3	6	.....	.....	.....	6	
Amador.....	.....	.....	.....	.....	.....	.....	No returns received.
Butte.....	78	.....	.....	.....	.....	156	
Calaveras.....	36	26	46	38	34	.....	
Colusa.....	.....	.....	.....	.....	.....	.....	No returns received.
Contra Costa.....	43	42	44	10	.....	76	
Del Norte.....	.....	.....	.....	.....	.....	.....	No returns received.
El Dorado.....	.....	.....	.....	.....	.....	.....	No returns received.
Fresno.....	.....	.....	.....	.....	.....	.....	No returns received.
Humboldt.....	46	66	26	.....	.....	92	Nationality of males only re- [ported.
Inyo.....	9	18	.....	10	8	.....	
Kern.....	8	15	1	.....	.....	16	
Klamath.....	3	3	3	.....	.....	6	
Lake.....	.....	.....	.....	.....	.....	.....	No returns received.
Lassen.....	7	12	2	.....	.....	14	
Los Angeles.....	180	312	48	.....	.....	360	
Marin.....	.....	.....	.....	.....	.....	.....	No returns received.
Mariposa.....	40	58	22	4	2	74	
Mendocino.....	48	80	16	4	8	84	
Merced.....	12	22	2	.....	.....	24	
Mono.....	.....	.....	.....	.....	.....	.....	No marriage licenses issued.
Monterey.....	.....	.....	.....	.....	.....	.....	No returns received.
Napa.....	.....	.....	.....	.....	.....	.....	No returns received.
Nevada.....	.....	.....	.....	.....	.....	.....	No returns received.
Placer.....	49	92	6	2	.....	96	
Plumas.....	12	18	6	.....	.....	24	
Sacramento.....	189	.....	.....	.....	.....	378	
San Bernardino.....	40	.....	.....	.....	.....	80	
San Diego.....	.....	.....	.....	.....	.....	.....	No returns received.
San Francisco.....	1968	.....	.....	.....	.....	3936	
San Joaquin.....	162	.....	.....	.....	.....	324	
San Luis Obispo.....	44	60	28	.....	.....	88	
San Mateo.....	.....	.....	.....	.....	.....	.....	No returns received.
Santa Barbara.....	.....	.....	.....	.....	.....	.....	No returns received.
Santa Clara.....	.....	.....	.....	.....	.....	.....	No returns received.
Santa Cruz.....	.....	.....	.....	.....	.....	.....	No returns received.
Shasta.....	.....	.....	.....	.....	.....	.....	No returns received.
Sierra.....	34	46	22	.....	.....	68	
Siskiyou.....	41	71	11	40	42	.....	
Solano.....	.....	.....	.....	.....	.....	.....	No returns received.
Sonoma.....	.....	.....	.....	.....	.....	.....	No returns received.
Stanislaus.....	23	40	6	.....	.....	46	
Sutter.....	.....	.....	.....	.....	.....	.....	No returns received.
Tehama.....	.....	.....	.....	.....	.....	.....	No returns received.
Trinity.....	17	20	14	14	2	18	
Tulare.....	.....	.....	.....	.....	.....	.....	No returns received.
Tuolumne.....	40	44	36	.....	.....	80	
Yolo.....	55	.....	.....	.....	.....	110	
Yuba.....	82	.....	.....	.....	.....	164	
Totals.....	3169	1051	339	122	96	6320	[March, 1871. Official year ended 1st Monday

## URING T

DEC		JUNE.				TOTAL		TOTAL		Grand total of all births.....
Males.....	Females.....	Males.....	Females.....	Live-born.....	Still-born.....	Males.....	Females.....	Live-born.....	Still-born.....	
4	4	10	16	24	2	59	68	114	13	127
4	1					2		2		2
7	8	1	6	7		45	61	99	7	106
2	2	3	2	5		60	44	96	8	104
3						18	23	39	2	41
	1	2	2	4		20	16	32	4	36
		1		1		20	8	24	4	28
4	3									
		2	2	4		43	36	71	8	79
2	4					5	5	7	3	10
1	1	1		1		28	27	51	4	55
						4	7	10	1	11
							1	1		1
	1					1	1	2		2
1						9	13	20	2	22
2						5	4	8	1	9
1	5					5	7	11	1	12
1	2					8	12	18	2	20
2	1	1	1	2		17	13	27	3	30
1	1					11	8	17	2	19
						5	8	12	1	13
2	3					2		2		2
2	7	3	4	6	1	37	39	69	7	76
5	1		1	1		30	40	64	6	70
5	7	2	3	5		58	70	118	10	128
1	3	6	6	11	1	47	50	89	8	97
22	25	1		1		9	11	18	2	20
3	2	23	14	35	2	309	246	512	43	555
4	1					6	4	9	1	10
57	52	5	3	7	1	40	27	58	9	67
4	2	54	57	94	17	719	630	1,069	280	1,349
1	3	3	3	5	1	38	38	70	6	76
1	1	1		1		11	14	22	3	25
1		2		2		24	15	36	3	39
8	7					9	6	14	1	15
1	2	8	10	17	1	65	55	110	10	120
2	2	3	2	5		42	48	82	8	90
2	2		2	2		15	15	28	2	30
1	3	1	3	4		25	34	54	5	59
14	9	5	1	6		25	22	43	4	47
4	3	9	11	18	2	126	108	215	19	234
1	1	2	1	3		44	42	80	6	86
1		1		1		9	5	13	1	14
	2		1	1		10	14	21	3	24
2		2		2		19	18	33	4	37
	1	1	1	2		18	15	30	3	33
		2	2	4		16	12	26	2	28
1	2					9	9	17	1	18
1	2	1	1	2		67	51	110	8	118
		5	5	9	1	35	34	63	6	69
81	177	160	161	291	30	2,229	2,034	3,736	527	4,263



This is lower than in any European nation, except France and Belgium. In Philadelphia it is one to forty-six and thirty-five hundredths; while in New York it is one to eighty-seven and thirty-seven hundredths. The contrast afforded by Boston, where but very few births escape registration, is creditable to the operation of the law in Massachusetts. Now, four thousand two hundred and sixty-three births, in California, to five hundred and sixty thousand two hundred and twenty-three population, as ascertained by the late United States census, is as one to one hundred and thirty-one and four-tenths!

With due allowance for the disproportion of the female part of our population, the imperfection of our birth record, thus revealed, is made still more glaring when it is stated that ten per cent., divided equally as to sex, has been added to the returns from some places, where no account was given of stillborn and premature births. This ratio to the total births, which is based upon the returns for San Francisco and Sacramento, and which must be ascribed to the general and unnatural aversion of American mothers to the rearing of children, and to the ignorant, conscienceless abortionists and midwives, who are permitted to ply their avocation, is perhaps too excessive to be applied to our country towns. But allowing this, and placing it in conjunction with the fact that the year has been an uncommonly healthy one, and that, in accordance with the records of all times and places, the causes which determine a low death rate likewise determine a high birth rate, the incompleteness of our table is no longer questionable.

The same may be said of the table of marriages. The deficiency of the latter is not due, however, to the incompleteness of the record, for the law is so stringent in this respect that no marriage is legal without a certificate to that effect, but to the failure of the County Clerks or proper officers to make their returns. For the purposes, therefore, for which they were compiled, these tables are utterly worthless. In one respect they may prove of some value, and that will be in demonstrating to our legislators that a system of registration based upon the returns of accoucheurs and midwives, and the gratuitous labor of County Clerks, will not work, and that some other plan, in accordance with the draft of an Act, submitted with this report, must be devised, if ever we are to have *accurate* records of the most important eras in the lives of the community.

For reasons of a similar character, the scheme of ascertaining the health status of the State from the records of that noble institution, Odd Fellowship, constituted as it is, for the most part, of the *élite* of the working classes, had to be abandoned. The great amount of clerical labor devolving upon the Secretaries of these Lodges, their frequent changes in office, and their slight familiarity with the nomenclature of diseases and the objects sought to be attained by medical statistics, soon convinced us that it was imposing too heavy a burden upon the already overtasked officers. Nevertheless, a valuable table of results, derived from six months' returns during the sickliest season, from those Lodges that reported continuously, has been framed and is here presented. Distributed, as these Lodges are, throughout the State—composed of the resident portion of the population, of men who are engaged in the various industries of life, and necessarily sober, prudent and temperate in all things—it follows that the relative proportion of sickness and mortality derived from such a source must prove a valuable standard for estimating the real condition of the State as to salubrity, for present as well as future comparative purposes.



No. 119..	1	1	2	49	0	0	1	1	1	2	0	2	0	2	176	3.14	88	.....	1	1	50.	Markleville, Alpine County.
No. 123..	8	1	9	197	2	3	3	0	1	5	4	5	4	5	72	.09	8	.....	2	1	11.	San Francisco, San Fran. Co.
No. 124..	9	3	12	286	4	8	0	0	0	7	5	4	8	8	372	1.13	31	8	2	2	16.6	San Francisco, San Fran. Co.
No. 127..	2	1	3	34	1	1	1	1	0	3	0	2	2	1	21	.15	7	3	.....	.....	0.	Howland Flat, Sierra County.
No. 128..	29	2	31	71	4	20	6	1	6	29	2	2	2	29	465	6.13	15	23	8	.....	0.	Somerville, Contra Costa Co.
No. 132..	1	0	1	27	0	1	0	0	0	1	0	1	0	1	7	.06	7	1	.....	.....	0.	Colfax, Placer County.
No. 137..	1	1	2	34	0	1	1	1	1	2	0	.....	.....	2	120	3.13	60	1	1	.....	0.	Sequel, Santa Cruz County.
No. 144..	1	1	2	95	1	1	0	0	0	2	0	2	0	.....	112	1.04	56	1	.....	1	50.	Oakland, Alameda County.
No. 148..	2	0	2	38	2	0	0	0	0	0	2	1	1	1	14	.09	7	2	.....	.....	0.	Havilah, Kern County.
No. 153..	5	4	9	55	0	7	1	1	1	5	4	9	.....	.....	126	2.07	14	7	2	.....	0.	San Diego, San Diego County.
No. 155..	12	1	13	112	3	1	8	1	8	7	6	10	3	.....	442	3.23	34	11	1	1	7.7	San Francisco, San Fran. Co.
No. 156..	2	0	2	19	0	0	0	2	0	1	1	2	.....	42	2.04	21	2	.....	.....	.....	0.	Santa Barbara, Santa Barb. Co.
No. 158..	1	2	3	34	0	3	0	0	0	3	0	1	2	.....	90	2.16	30	3	.....	.....	0.	Railroad Flat, Calaveras Co.
No. 165..	1	0	1	30	0	1	0	0	0	1	0	.....	.....	14	.11	14	1	.....	.....	.....	0.	Grass Valley, Nevada County.
No. 168..	6	2	8	56	3	3	2	2	0	6	2	7	1	1	104	1.21	13	6	1	1	12.5	San Luis Obispo, S. L. O. Co.
Total, 38	207	48	255	2,889	34	113	85	23	181	74	114	141	5,553	1.22	920	212	29	14	6.4			



From this table we learn in what Lodges, and of course, in what localities the greatest amount of sickness and death occurs, which should lead to an investigation of the causes, and necessarily to a correction of the evil. The difference in the value of life under the beneficent home treatment of the relief committees, when contrasted with the results of hospitals, may also be readily seen. It must, however, be observed here, and it should be borne in mind when we come to the exhibit of hospital treatment, that the mortality is not of itself altogether a measure of success or of failure.

It is quite possible that an hospital, or a practice with a high mortality, may be especially successful. For it may number among its items extraordinary cases of danger and difficulty, and the figures may be so small that a very little addition to the deaths will have a very remarkable influence in increasing the average mortality in it. So, also, in the percentage of deaths to diseases; the mortality may appear enormous, as set down in our table, to Lodges numbers forty, one hundred and nineteen and one hundred and fourteen, all in healthy localities; while actually there were only two sick in each of these Lodges, and one death in each during the six months.

For this, and other reasons that may be adduced, many contend that no reliance is to be placed upon medical statistics. "A little reflection," says an able statistician,\* "ought to show that figures are like words, and that anything can be proved by either, *provided* only the premises be granted; and that he who is more readily deceived by the one than by the other, owes it to the faulty construction of his own mind, rather than to any special superiority of figures over words to convey falsehoods."

Again, it is a very common impression that vital statistics are of but little practical value to any but physicians and life insurance companies. Now, it is very evident that record proof of the birth, marriage or death of any and of all persons may become of great importance from a legal standpoint. Faithfully collected and skilfully managed, these statistics furnish accurate knowledge of the most important facts of each citizen, and also the data upon which governments and communities, as well as individuals, may base their action. Through their instrumentality, not only the birth rate and death rate are established so positively that deviations from the normal state are readily discovered, but the ratio of the deaths by every special disease to the total population, and to the total deaths; that is, the prevalency and fatality of every disease, and likewise the ratio of deaths by a special disease to the total number of cases of the same disease; that is, the chance of recovery, when attacked by this disease, are revealed. Life, health, property—all that man holds dear, are thus, we see, involved in these statistics; and from them has sprung into existence that great characterizer of modern civilization, *State Medicine*, whose machinery we are now trying to put into motion in California. Of course, the figures that express facts of such deep, practical import, should be perfectly accurate and precise. Unfortunately, this precision is rarely attainable in vital statistics. But even should they fail in this respect, provided the figures approximate correctness they lead to an approximative truth. These remarks are intended to apply specially to the statistics we are now presenting. Absolute accuracy cannot be claimed for them. They have been gotten up to meet an emergency; and thus, while errors have crept in, owing chiefly to irregularities in returns and to clerical errors, when bringing together certain facts to ascertain the result of such grouping, the deductions, in which their practical value really lies, are in the main correct.

\* Stanford E. Chaille, A. M., M. D., New Orleans.

TABLE showing the total mortality, as well as that by the most prevalent diseases, in twenty-four localities, comprising nearly half the population of the State, with the ratio of deaths to one thousand of population, from July, 1870, to June, 1871, inclusive; also, the authorities for the data.

CITIES AND TOWNS.	Population .....	Total number of deaths.....	Ratio of deaths per 1,000 of population.....	PREVALENT DISEASES.						AUTHORITIES.
				Consumption.....	Other diseases of lungs.....	Diseases of stomach and bowels.....	Diphtheria....	Scarlatina..	Typho-malarial fevers.	
San Francisco.....	150,351	3,214	21.4	518	245	143	34	62	165	San Francisco Board of Health.
Sacramento.....	16,298	391	24.0	60	34	28	4	7	13	Sacramento Board of Health.
Petaluma.....	3,514	45	12.8	6	2	4	.....	1	.....	G. W. Graves, M. D.
Dixon and surroundings.....	5,000	17	3.4	2	2	1	.....	1	.....	R. H. Plummer, M. D.
Santa Clara.....	3,470	92	26.5	18	5	11	2	3	6	H. H. Warburton, M. D.
Stockton.....	10,033	182	18.1	23	15	25	2	.....	4	Stockton Board of Health.
Marysville.....	4,375	127	29.0	17	18	4	.....	3	13	C. E. Stone, M. D.
Placerville.....	1,562	29	18.6	2	3	1	.....	.....	.....	E. A. Kunkler, M. D.
Auburn and surroundings.....	2,500	15	6.0	4	1	2	.....	.....	.....	A. S. Dubois, M. D.
San Diego County.....	4,957	66	13.3	19	2	5	1	.....	6	County Medical Society.
San Luis Obispo.....	2,000	28	14.0	9	2	.....	.....	.....	.....	W. W. Hays, M. D.
Oroville and surroundings.....	1,500	36	24.0	7	6	.....	.....	.....	.....	J. M. Vance, M. D.
Woodland.....	2,200	23	10.5	3	3	.....	1	3	3	A. B. Mehring, M. D.
Oakland.....	11,104	117	10.5	26	7	5	1	3	2	T. H. Pinkerton, M. D.
Los Angeles.....	5,614	76	13.5	17	9	6	.....	.....	.....	H. S. Orme, M. D.
Nevada City.....	5,500	36	6.5	6	.....	3	.....	.....	.....	J. A. Guffin, M. D.
Truckee and surroundings.....	1,220	16	13.1	.....	.....	1	.....	1	.....	William Curless, M. D.
St. Helena and surroundings.....	3,000	15	5.0	5	3	2	.....	2	.....	J. S. Adams, M. D.
San José.....	9,091	193	21.2	25	13	21	7	3	12	J. N. Brown, M. D.
Napa City.....	3,500	43	12.3	2	2	4	.....	.....	5	M. B. Pond, M. D.
Fort Jones (Siskiyou) and surroundings.....	2,000	24	12.0	.....	.....	3	.....	3	2	T. T. Cabanis, M. D.
Watsonville.....	2,000	16	8.0	.....	.....	1	.....	.....	.....	C. E. Cleveland, M. D.
Folsom and surroundings.....	3,000	15	5.0	2	5	.....	1	.....	.....	L. McGuire, M. D.
Bridgeport Township.....	3,000	15	5.0	.....	.....	.....	.....	.....	.....	J. L. Assay, M. D.
Twenty-four localities.....	256,783	4,831	13.9	774	380	270	53	93	237	

In the foregoing table, showing as completely as it is possible to do under existing circumstances, the death rate in twenty-four of the principal cities and towns, as well as the total mortality by all causes, and the deaths by some of the most generally prevalent diseases, we gain such an insight into the real sanitary condition of the State as will afford groundwork for future operation. As with the table derived from the Odd Fellows' statistics, we thus establish a standard of comparison, during a favorable year, for determining the comparative health of different localities, not only for the present, but for all coming time. Such differences demonstrate at once that different causes are at work; and in the search for these and their remedies, we proceed in the annexed table from the general to the special—from the number of deaths in the year to those by months; also, the sex, race, age and nativity.

From all causes we proceed to special causes, and in the following table we trace through the progression of the months the fatal march of certain prevalent diseases:

*Table of Mortality of Prevalent Diseases, by Months.*

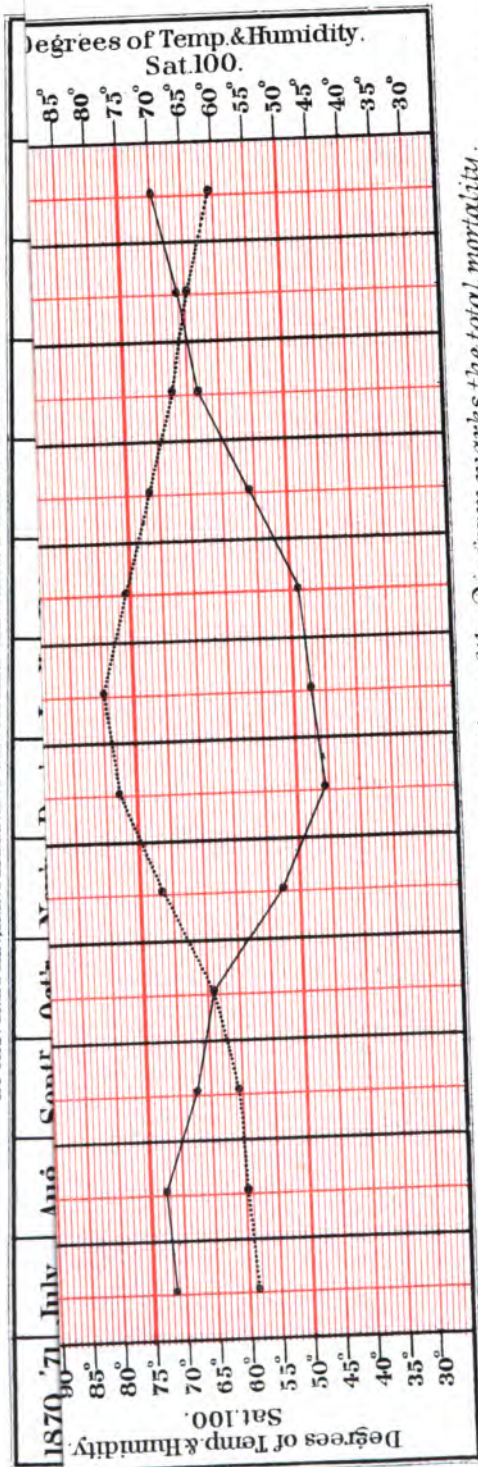
1870-71.	Consumption .....	Other dis. of lungs.	Diseases of stomach and bowels. ....	Diphtheria.....	Scarlatina.....	Typho-malarial fevers .....	Total .....
July .....	57	21	37	7	4	18	144
August .....	63	24	38	5	3	13	146
September .....	63	19	29	5	6	21	143
October .....	64	27	33	4	15	34	167
November .....	64	33	18	9	15	43	182
December .....	65	51	22	6	13	24	181
January .....	85	48	9	9	15	30	196
February .....	59	51	11	0	6	13	140
March .....	70	42	12	2	4	13	143
April .....	69	22	8	4	4	7	114
May .....	55	23	33	1	4	8	124
June .....	60	19	30	1	4	13	127
Totals.....	774	380	270	53	93	237	1,807

Comparing the results in this table with the accompanying profile view of the monthly and annual mortality from all causes, the most superficial glance will show how the deaths from pulmonary diseases swell out the bills of mortality, and how the crest of the disease wave reaches its maximum altitude when, after the long continued summer's heat, the vital resistance is most impaired, and the civic and climatic sources of disease are in their most abundant and active condition. In looking over our carefully kept mortality tables, for the past twenty years in Sacramento, we find that whenever any extraordinary degree of mortality prevails, it has always been at this season. In San Francisco,

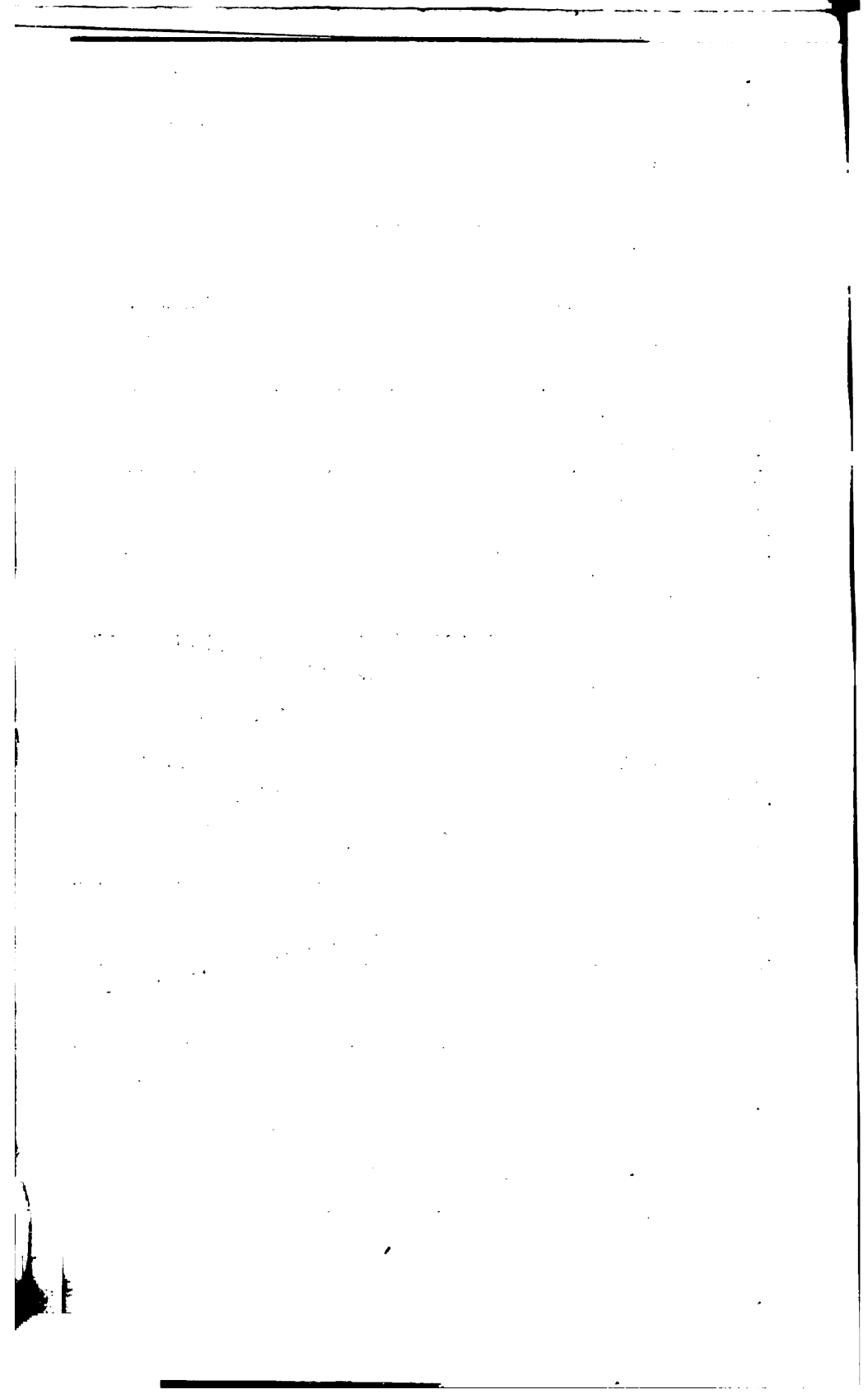
# A PROFILE VIEW

**OF THE MONTHLY & ANNUAL MORTALITY DERIVED FROM THE RETURNS OF 24 CITIES & TOWNS IN CALIFORNIA,**  
 comprising nearly half the population of the State; also of the monthly curves of mean Temperature & Humidity  
 for the corresponding period at Sacramento.

BY THOS. M. LOGAN, M.D. PERMANENT SECRETARY CAL. STATE BOARD OF HEALTH.



The heavy black line across the upper section of the Diagram marks the total mortality.  
 The red figures and line " " " the mortality by consumption.  
 The fine black line " " " the monthly curves of mean Temp.  
 The dotted line " " " Humidity.



though the same conformity of mortality to season does not always obtain, still the same observations apply with equal force.

To the dying out of the strong oceanic winds and the stagnant condition of the atmosphere, before the purifying rains set in, may be attributed the increased rate of mortality there in the early winter months. The correlation of consumption with the total mortality, and their connection with humidity and coldness, is clearly defined in the coincident curves representing these facts and conditions. December and January are our coldest and most humid months, particularly the latter, as shown in the curves of temperature and humidity, and accordingly, we find the curve of total mortality, which was arrested in its upward course by the effect of the frosts of winter upon malarial diseases, again forced upwards by the increased number of deaths from consumption. In February, which is a comparatively dry month constituting a period of interregnum between the former and latter rains, we see the climatic influence, both in the curve of mortality and of consumption. The steady descent of the former curve, somewhat deflected in its course by the cold winds of March, until the middle of April—which latter our records of the last twenty years establish as the healthiest month—is shown to be too great to be influenced by the slightly increased mortality from consumption, attributable to the chilling winds of spring.

Whatever may be due to the number of cases, in the last stages of pulmonary disease, that come to California for the benefit of the open-air treatment, and also to the less definite employment of nosological nomenclature, which allows many deaths to be credited to consumption that actually are caused by various other chronic affections, we still are warranted in the conclusion that the rate of mortality (sixteen per cent. of the total of all that die) shows that there must exist some special cause more or less active in determining the mortality by this one disease; and although the causes which affect the health of cities and towns are exceedingly complex, so that it is impossible to assign to each its share in the production of disease, still, it may fairly be presumed that the predominance of pulmonary affections in California, at a certain period, as revealed in our diagram, is mainly attributable to the influence of the wet season, when the conditions of physical discomfort from cold and dampness are so much increased. In these deductions as to the cause of phthisis, which are in perfect accordance with those of Dr. Bowditch, the President of the State Board of Health of Massachusetts, and of Dr. John Simon, the Chief Medical Officer of the English Privy Council, the climate of California is, *e converso*, demonstrated to be most admirably adapted for phthisical patients, inasmuch as it is unsurpassed, during nine months in the year, for dryness and, necessarily, for tonic qualities, by any other on the face of the globe.

The establishment of this one fact, based as it is upon deductions from observations and positive knowledge, is worth more to the State, in a financial point of view, than the accumulated cost of the State Board of Health would reach in a century.

An exact estimate of the comparative healthfulness of cities in the United States, based upon the recent census, discloses the fact that San Francisco is equalled in this respect by only one of our large cities, viz: St. Louis; and we believe that, with good drainage, sewerage and proper attention to ventilation, and the admittance of sunlight into the dwellings of the rich as well as the poor, not only San Francisco, but all the

towns of California, will present a lower death rate than any city in the world. As has been well ascertained by sanitarians, the removal of the causes of sickness involved in cold, damp and foul air affords the best protection, not only against consumption, but against virulence and fatality in all diseases, particularly those of infancy. We cannot, perhaps, therefore, better discharge our duty to the State, than by quoting the following remarks from the great English authority just referred to, in his tenth annual report:

"Phthisis, so far as it depends on wetness of soil, may easily, in great part, be made preventable. \* \* \* An undrained soil, in any place where population is aggregated, answers to the legal intention of the word 'nuisance;' and, I apprehend, that even in the present state of the law, the local sewer authority is bound to provide that such shall not continue through want of proper construction of drainage."

PRINCIPAL CITIES.	Population, U. S. Census 1870.....	Deaths in 1870.....	Ratio of deaths per 1,000 of population .....
St. Louis.....	312,963	6,670	21.3
San Francisco.....	150,351	3,214	21.4
Sacramento.....	16,298	391	24.0
Boston .....	253,984	6,096	24.0
Chicago.....	299,370	7,342	24.5
Philadelphia.....	657,179	16,750	25.5
Baltimore.....	267,599	7,262	27.1
New York.....	927,436	27,175	29.3
New Orleans.....	184,688	6,942	37.6

In the above table, which has been framed for comparative purposes, all the data are taken from the fourth annual report of the Board of Health of St. Louis, except those for San Francisco and Sacramento, which are extracted from our table for the twelve months, from July, eighteen hundred and seventy, to June, eighteen hundred and seventy-one, inclusive. From the failure to ascertain, as already stated, the rate of yearly increase, both by births and immigration, which are necessary elements in the calculation of the decimal ratios that would give the death rate with mathematical precision, we have relied solely upon the returns furnished by the late United States decennial census, while, in at least two instances, the Health Officer has given the population as some thousands above the census, which renders the comparison less just.

It will be seen that in all the cities, St. Louis excepted, the ratio is from two to eight per one thousand greater than in San Francisco. The death rate given is unusually low for the former city, while the remarkable fact that one hundred and fourteen more than half of the decedents (three thousand four hundred and forty-nine) are put down for the same year as under five years of age. By reference to the proper table above, it will be seen that the mortality during the same period of life was in

TIES, COM

May.....	.....
226	2
38	
3	
3	.....
7	
12	1
5	
4	
.....	
4	
2	
.....	
10	
8	1
2	.....
2	
2	
12	1
.....	
1	
.....	
2	
3	
346	34



The subject of mortality by races possesses great interest for all nations, which, like ours, are so diversely inhabited. The record of decedents belonging to races other than white, will be more valuable when the proportion of the Mongolian and negro population is known, and the percentage of deaths to the same is given. In the nativity of persons deceased are, of course, included among Americans the children of foreigners when born in the United States, and they make a very large proportion of the whole number. "Foreign" includes all except those born in the United States.

The Secretary of the Commonwealth of Massachusetts states such has also been the custom in that State. That term, therefore, includes those born in Canada.

In bringing his remarks to a close on the subject just discussed, the writer refers to the original figures in the tables presented, from which other important facts may be gathered by those possessed of more mathematical skill and patience and larger knowledge of the subject. He does not claim perfect accuracy for his calculations, and hopes to review and amend them in the future.

#### HOSPITAL STATISTICS.

A reliable estimate of the mortality among patients treated in hospitals and in their own homes, is a very great desideratum. Notwithstanding our multiplied circulars and blank schedules distributed among the physicians in the State, with this end in view, it was found that from want of continuity, those returns from private practice which were received, failed to answer the purposes for which they were intended, and therefore that it would be no better than arithmetical idleness to be constructing, upon such a basis, a standard of comparison between hospital and home practice. The main object aimed at by us in such inquiries was, as conservators of the public health, having a supervision over those institutions which receive the bounty of the State, to ascertain their real sanitary condition, and when found presenting a lower death rate than circumstances and surroundings seemed to justify, to institute an inquiry into their causes.

In the absence of the statistics required, we have, in the table of the results of the home treatment, derived from Odd Fellowship, an opportunity of forming some opinion as to the general results. Making every allowance for difficulties attending an inquiry into the comparative mortality of hospital and private practice, we think the contrast afforded by the following table with that of Odd Fellowship, speaks plainly in favor of the latter. It is easy to see that if the general average death rate of the former was as low as the latter, there would be an annual saving of as many lives as are expressed in the difference of the respective death ratios. Such an increase of lives would afford a yearly income to the State equivalent to the tax per capita. This sum, however, represents only a small part of even the *financial benefit* that would accrue to the State; for the consequent saving of life and sickness would augment the health and ability of the active-useful members of society, and increase individual and indirectly public wealth.

If to this large gain be still further added the taxes we pay for the support of hospitals and other public charitable institutions, it is plainly evident that, by every dictate of reason and philanthropy, are we urged on to provide for the indigent sick, not upon the narrow-minded policy of the least possible cost, but upon the broad statesman-like views, that the

greater the number saved from death, and the sooner they are restored to health, the greater is the gain of the State.

As, however, the very nature of the case involves the impossibility of home treatment with all of the indigent sick, and hospitals thus become necessary evils, it would seem that the nearer we can make them conformable with the conditions of a comfortable home, the better adapted will they be towards fulfilling the requirements indicated.

To do this we have only to follow out the first principles of modern hospital construction, and that is, to divide the sick, when large numbers are to be provided for, among separate pavilions. "By a hospital pavilion is meant a detached block of buildings capable of containing the largest number of beds that can be placed safely in it, together with suitable nurses' rooms, ward sculleries, lavatories, baths and water closets, proportioned to the number of sick, and quite unconnected with any other pavilions of which the entire hospital may consist, or with the general administrative offices, except by light airy passages or corridors." (Florence Nightingale.) In this way we avoid any undue agglomeration of the sick, and insure a proper degree of ventilation, cleanliness and other sanitary requisites, which afford most of the advantages to be derived from home treatment.

It must not be inferred from what has been advanced that the ratio of mortality in our hospitals exceeds the proportion that obtains in other places. On the contrary, by referring to the following table of results of twenty-four hospitals, it will be found that it compares most favorably with that of the best hospitals in the most healthy countries, and presents the same evidence of the salubrity of the climate that is demonstrated in our table of the total mortality of the State :

TABLE exhibiting the number of indigent sick, with the results, in twenty-four charitable institutions, and the percentage of deaths to the cases; also, the total average percentage of deaths.

NAME AND LOCATION OF EACH HOSPITAL.	No. of months reported.....	Total admitted	Discharged cured.....	Discharged.....	Died.....	Percentage of deaths.....	Remaining under treatment	Physician.
Sacramento County Hospital, Sacramento.....	12	467	273	64	54	11.6	76	A. C. Donaldson, M. D.
Central Pacific Railroad Hospital, Sacramento.....	12	434	421	.....	9	2.1	13	A. B. Nixon, M. D.
Colusa County Hospital, Colusa.....	6	23	9	9	2	8.7	3	J. M. Banks, M. D.
Lassen County Indigent Sick, Susanville.....	12	3	1	.....	.....	.....	2	Z. N. Spaulding, M. D.
San Bernardino County Hospital, San Bernardino.....	12	17	14	.....	1	5.9	2	J. C. Peacock, M. D.
Fresno County Hospital, Millerton.....	10	40	34	2	2	5.0	4	Lewis Leach, M. D.
Siskiyou County Hospital, Yreka.....	12	40	33	26	15	15.3	14	D. Ream, M. D.
Sonoma County Hospital, Santa Rosa.....	12	98	33	.....	17	12.1	29	R. Press Smith, Jr., M. D.
Los Angeles County Hospital, Los Angeles.....	12	141	95	.....	4	14.8	9	Griffin & Widney, M. D.
Sierra County Hospital, Downieville.....	12	27	9	5	.....	18.2	11	George C. Chase, M. D.
Napa County Hospital, Napa City.....	6	66	33	10	13	11.0	30	M. B. Pond, M. D.
Butte County Hospital, Oroville.....	12	182	132	.....	20	11.0	6	T. J. Jenkins, M. D.
Plumas County Hospital, Quincy.....	12	6	5	.....	.....	.....	5	L. F. Cate, M. D.
Placer County Hospital, Auburn.....	18	189	141	39	20	11.1	20	A. S. Dubois, M. D.
Santa Clara County Hospital, San José.....	10	340	.....	.....	21	6.2	.....	A. J. Cory, M. D.
Merced County Hospital, Snelling.....	12	11	5	.....	2	18.2	2	J. W. Tucker, M. D.
San Joaquin County Hospital, Stockton.....	12	195	171	.....	24	12.3	.....	Chas. A. Ruggles, M. D.
Solano County Hospital, Suisun.....	3	22	11	.....	.....	.....	11	S. D. Campbell, M. D.
State Prison Hospital, San Quentin.....	12	125	92	7	13	10.4	13	A. W. Talladerra, M. D.
Shasta County Hospital, Shasta.....	12	46	35	.....	3	6.5	11	Benjamin Shurtleff, M. D.
Humboldt County Hospital, Eureka.....	8	16	6	.....	4	25.0	6	E. L. Barber, M. D.
Inyo County Indigent Sick, Independence.....	3	7	4	.....	2	28.6	1	C. B. White, M. D.
Yolo County Hospital, Woodland.....	6	56	25	20	7	12.5	4	E. L. Parramore, M. D.
Alms-house, San Francisco.....	12	626	203	82	39	6.2	302	Edward Kelly, M. D.
Total results from twenty-four hospitals.....	250	3,138	1,758	264	271	10.1	570	

The only wonder is, that considering the general want of accommodation, ventilation and other sanitary defects ruling in all our hospitals and public charities, that the death rate is not greater. And such appears to be the wilful determination of those who have authority in these matters, that even in the few hospital structures which have been more recently built, although they may be constructed large enough to meet present as well as prospective wants, still, the one dominant idea is invariably expressed in the ample provision made for the agglomeration of as large a number of sick as possible under one roof. Nor is this fault confined to hospitals alone, but it pervades all our public institutions. Especially would we here refer to our State Prison and Lunatic Asylum. We speak from personal inspection of these establishments, made during an official visit in May last, when we reiterate the opinion expressed by the able medical officers attached to these charities, that they are entirely deficient in accommodation and, of course, in such general administrative arrangements as are desirable for the amelioration of the condition of the inmates, and for effecting the greatest possible number of cures of the insane as well as of the sick, whether morally or physically so. The uniform policy of an enlightened State should be to provide equally and liberally for its afflicted citizens, whether poor, insane or criminal, and it is to be hoped that our young, advancing commonwealth will not, by a parsimonious step, turn back half a century from the light and progress of the age in the perpetration of ignorant and cruel blunders.

#### REPORTS OF PHYSICIANS.

##### *Report of the Physician of the State Prison.*

SAN RAFAEL, April 22d, 1870.

*To Dr. Thomas M. Logan, Secretary State Board of Health :*

In compliance with your request, I send you a tabular list of the number of sick and their diseases that have been treated in the hospital of the State Prison for the last twelve months; also, the number of deaths, and the insane that have been sent to the Asylum. I am limited for hospital rooms, and therefore admit none but the most aggravated cases to them. Those of a milder form are treated as outside patients, and there are, on an average, some twenty-five or thirty under daily treatment. I have not deemed it necessary to have prepared for you a list of these cases, as there is no prevailing disease here, but if you desire information on the subject, I refer you to the report of the State Prison Directors for December, eighteen hundred and sixty-nine. In it you will find a full report from me, and you can form from it a very accurate idea of what has been under daily treatment here for the last year. The health of the prison is wonderful, when we consider its crowded state. There are now confined here but a fraction under nine hundred prisoners. The accommodations for these men are three hundred and ninety-six single cells, forty-eight cells holding four each, and six long rooms. These single cells are nine feet by four, with a height of seven feet, and contain in a middle wall, for the purpose of ventilation, a circular opening three and one-half inches in diameter, and in each door an opening eight by two inches. The forty-eight cells holding four are ten feet six inches by six feet in dimension, with a height of eight feet. The ventilation of these consists of an opening in its wall of two feet by six inches, and in

the door eight inches by three and one-half. Five of the long rooms are each twenty-six by twenty-four feet in size, and the sixth twenty-four by thirteen. In these rooms are confined two hundred and fifty-three prisoners. This exhibit shows a deficiency in ventilation and room that seems incompatible with health, and the good sanitary condition of the place must be attributed altogether to its natural healthiness. There is but one ailment that I can charge to this crowded state, and that is, a functional derangement of the heart. This is very common and is increasing as the number of prisoners increases.

I suppose I can safely say there have been some thirteen hundred men confined at the prison during the last twelve months. Out of that number there have been thirteen deaths, a rate of mortality very low under the most favorable circumstances; but when we consider that they are the representatives of all parts of the world, and as a general thing from their most degraded classes, with their systems tainted either by inheritance or their own indiscretions, it shows an extraordinary low death rate. I am seldom called upon to treat acute diseases, and when they do occur they are generally of a mild form and readily yield to treatment. The death list shows them all chronic but two—lead poison and nostalgia. The case of nostalgia was interesting. I call it nostalgia, because the man died apparently without any organic disease. He came to the prison under a strong sense of injustice done him, was placed at once in the hospital and died within two months. No post mortem was made, because his body was given to his wife.

You will see by the insane list, there have been seven sent to the Asylum. I now have on hand some three or four cases of simple dementia. The study of the mental organization of these criminals is a very interesting one.

It will be seen by the report that there have been two cases of pneumonia. These came on secondarily, during the course of a bilious fever, and only the posterior lobe of the lungs was involved. I will state further, that high winds prevail at this place during the summer season.

Yours, very respectfully,

ALFRED W. TALIAFERRO.

*Table of date, nativity and disease of decedents, from May 1st, 1870, to May 1st, 1871.*

Date.	Nativity.	Disease.	No.
May 22.....	Irishman.....	General debility.....	1
June 10.....	Chinaman.....	Scrofula.....	1
August 28..	Indian.....	Consumption.....	1
September 24.....	American.....	Consumption.....	1
October 29.....	Indian.....	Scrofula.....	1
January 14.....	Chinaman.....	Consumption.....	1
January 23.....	American.....	Lead colic.....	1
January 29.....	Californian.....	Bright's kidney disease	1
February 9.....	Portuguese.....	Nostalgia.....	1
February 14.....	Chinaman.....	Consumption.....	1
February 22.....	Chinaman.....	Consumption.....	1
March 18.....	German.....	Consumption.....	1
March 30.....	Chinaman.....	Consumption.....	1
Total.....	.....	.....	13

*Number of cases sent to Insane Asylum.*

Date.	No.
May 22, 1870.....	3
July 18, 1870.....	4
Total .....	7



*Number of Cases Admitted, Discharged and Treated in Hospital of the State Prison, San Quentin, from May 1st, 1870, to May 1st, 1871—Continued.*

MONTHS.		Total .....
May .....	.....	305
June .....	.....	22
July .....	.....	21
August .....	.....	20
September .....	.....	24
October .....	.....	29
November .....	.....	28
December .....	.....	29
January .....	.....	30
February .....	.....	33
March .....	.....	26
April .....	.....	22
Total .....	.....	305
Habitual use of opium.....	.....	5
Asthma .....	.....	2
Fistula palate.....	.....	1
Hydrocele .....	.....	2
Lead colic.....	.....	5
Bright's kidney disease.....	.....	2
Knife wounds.....	.....	2
Paralysis.....	.....	7
Ophthalmia.....	.....	8
Ascites.....	.....	4
Neuralgia .....	.....	2
Phymosis .....	.....	3
Ulcerated sore throat.....	.....	4
Rheumatism.....	.....	10
Sprained ankle.....	.....	1
Diarrhoea.....	.....	5
Nostalgia .....	.....	4
Inflammation bladder.....	.....	6



*Report of the San Francisco Female Hospital, from July 1st, 1870, to June 30th, 1871, by Professor C. T. Deane, M. D., physician in charge.*

Patients.	No.
Number of patients admitted.....	221
Number of patients discharged.....	201
Number of patients died.....	4
Number of patients remaining on June 30th, 1871.....	16
Total .....	221
Number of lying-in patients.....	141
Number of patients, general diseases .....	80
Total .....	221
Of the 141 lying-in patients, there were married.....	80
Of the 141 lying-in patients, there were unmarried.....	61
Total .....	141
Of the children born, there were girls .....	75
Of the children born, there were boys.....	69
There were three cases of twins, making the children, total..	144

Of the one hundred and forty-four children, eight were still-born.

No child, born alive, died during the time it was in the hospital.

Of the two hundred and twenty-one admissions, one hundred and thirty-two were residents of the City and County of San Francisco over thirty days; eighty-nine were residents less than thirty days.

The four deaths were from the following causes:

Phthisis .....	2
Ascites .....	1
Puerperal convulsions.....	1
Total .....	4

Besides the above, there have been treated in the dispensary attached to the hospital, from July first, eighteen hundred and seventy, to June thirtieth, eighteen hundred and seventy-one, a total of four hundred and twenty-three.

*First Annual Report of the San Francisco Lying-in and Foundling Hospital,  
269 Jessie Street, December 31, 1870, by Benjamin F. Hardy, M. D.,  
Attending Physician and Surgeon.*

We have been in operation but little over one year, with the following encouraging results, viz :

Fifty children have been born within the hospital.

Seven infants were brought to it, parentage unknown.

Of the fifty, three pairs were twins, twenty-eight males and twenty-two females.

Forty-six of them were born alive, and four dead. A knot in the cord caused the death of one.

Twenty-three of them are living and doing well.

One died within two hours of birth.

Two were overlaid and died.

Thirteen were taken away by mothers, and all are doing well.

Seven were adopted; two of these are dead.

Five of them remain in the Asylum, and are doing well.

Deduct the seven still-born, overlaid, etc., from the fifty, forty-three are left, or over fifty per cent.

Of those left on door steps, parentage unknown, four were males and three females.

Three of them were adopted and died.

Three of them died in the Asylum.

One of them is living in the Asylum, and doing well.

I have then to report, in all, fifty-seven infants, and the pleasure of reporting twenty-four of them alive and doing well. Presuming you will expect me to give you some information respecting the mothers, I subjoin the following :

My first patient was delivered in the hospital September nineteenth, eighteen hundred and sixty-nine.

To date, forty-seven mothers have been delivered of fifty children.

Forty-one mothers were primiparæ.

Thirty-eight mothers were unfortunate girls, otherwise respectable. These gave birth to forty children, thirty-six living.

Nineteen mothers were Irish.

Fourteen mothers were Americans.

Six mothers were English and Scotch.

Six mothers were European, mostly German.

Two mothers were, one full blood, and one half breed Indian.

Twenty-six mothers were Protestants.

Eighteen mothers were Roman Catholics.

Two mothers were Hebrew, and one, religion unknown.

Eight mothers of the thirty-eight are respectably married; two before, and six after the birth of child.

Forty-five of the forty-seven were natural labors.

One was delivered by forceps; pelvis small.

One was turned and delivered by feet, but not until after the mother had been insensible in convulsions several hours. Convulsions commenced with onset of labor. She continued insensible fourteen hours. All recuperated promptly, and were duly discharged in good health. There was not a single case of fever or other sickness.

## MEDICAL TOPOGRAPHY AND CLIMATOLOGY.

The extent of territory and the multiplicity of climates, curiously brought into contrast with each other at short distances, and the variety of soil within the limits of the State, render it a particularly favorable one for acquiring a comprehensive knowledge of the influence of various conditions upon the causes and rate of disease and mortality. In the three distinctive conformations into which the State is naturally divided, viz: the coast, the valley and the mountain regions, we find subordinate local differences of climate the most remarkable, resulting from subordinate features in the local configurations, particularly in the coast or seaward portion. Thus we find in the eastern slope of the Coast Range, between Point Conception and Cape Mendocino, a multiplicity and confusion of climates almost indescribable. South of Point Conception quite a different character of climate obtains. So with the elevated Sierra Nevada and Klamath basins and plateaus, the climatic features are totally changed; while the climate of the interior valleys, as well as of the Great Basin of Utah and the Colorado Desert, are as distinct from each other as they are from all the others. The immediate efficient cause of these complex atmospherical conditions seems to have so little direct connection with the well known effects of latitude and altitude, and the defences of mountain ranges, that it is not necessary to do more than refer generally to such topographical peculiarities as, from their prominence, seem to suggest a causative relation. The most obvious hypothesis would assume a causation, which is probably itself the coefficient of two elements—the sea winds and the temperature of the land air—the properties of the one, and the conditions of the other. With respect to the former of these two elements, the sea wind, observation and experience point to a deep sea current from the polar regions, of great magnitude and volume, which appears only by the lifting of its waters on approaching the coast of California, and in the general refrigeration of the waters of the whole area.

The body of water affected, as shown by Maury's charts, extends northwestwardly towards the peninsula of Alaska, and is found strikingly uniform in its characteristics of low temperature, absence of surface currents, and continuous northwest winds. This great mass of cold waters, and its attendant cold surface atmosphere, develop a strong sea wind towards the heated and rarefied interior valleys and plains, and where these contrasts of temperature are greatest, the maximum effect is produced as at San Francisco.

This hypothesis, attributing the community of causation of the coast climates to the temperature of the land air and that of the water of so large a portion of the ocean, is further sustained by the fact that the contrasts which induce these violent sea winds exist only in the summer months, including May and September, as at other seasons the temperature of the ocean is raised by a warm current flowing across from the China Sea, while the land becomes colder; and whatever the degree of aridity, the sudden and extreme rarefactions do not occur in the interior. The spring and autumn are, therefore, both warmer than the summer, on the immediate coast. In the winter, the reverse of this takes place. The Sierras are now covered with more or less snow, which extends down to their bases, whitening also not seldom the great valley, which has become colder than the coast region; while the southeast trades, charged to their utmost capacity with moisture, commence descending as their temperature decreases, and precipitate more and more rain as

they become chilled by the cold northerly winds. During the summer, owing to the fact of these polar breezes passing over a highly heated and arid surface, their temperature is raised, thereby increasing their capacity for moisture, which not being able to obtain from the surface passed over, they appear as dry winds, reminding us of the reputed sirocco of Italy. Dry, however, as these winds apparently are, on coming in contact with the westerly winds chilled by the oceanic polar current, and their temperature being again reduced, the vapor they contain is rapidly condensed; hence the heavy mists that are precipitated during the afternoon at San Francisco and at the gaps along the coast.

With the understanding of these facts, the varieties and anomalies of the California climates, especially of the coast, will become more readily comprehended by the intelligent inquirer after such special climates as may be deemed suitable for his particular form of disease, and for whose benefit the following compilation is here presented :

Comparative table of Meteorological Results in twenty-seven Stations in the Pacific States.

STATIONS.	Altitude above the sea, in feet.....	Latitude .....	Longitude.....	Length of period observed.....	TEMPERATURE.				Rain and snow, in inches .....	AUTHORITY AND REMARKS.
					Hottest mean day .....	Coldest mean day .....	Range.....	Mean.....		
Fort Yuma.....	120	° 32.43	° 114.36	6 years.	° 92.0	° 56.0	° 36.0	° 74.00	3.24	Army Met. Reg., 5 years, partially.
San Diego.....	150	° 32.42	° 117.14	7 "	° 74.0	° 52.0	° 22.0	° 62.00	10.43	Army Met. Reg., 3 years, partially.
Monterey.....	140	° 36.36	° 121.32	6 "	° 59.0	° 50.0	° 09.0	° 55.00	12.20	Army Met. Reg., 4 years, partially.
Fort Miller.....	402	° 37.00	° 119.40	5 "	° 90.0	° 47.0	° 43.0	° 66.00	24.51	Army Met. Reg., 4 years, partially.
San Francisco.....	22	° 37.48	° 122.27	19 "	° 78.0	° 39.0	° 39.0	° 55.90	22.09	Williamson and W. O. Ayres, M. D.
San Francisco.....	22	° 37.48	° 122.27	19 "	° 78.0	° 37.0	° 41.0	° 56.40	21.50	Henry Gibbons, M. D.
Benicia.....	183	° 38.08	° 120.14	8 "	° 80.0	° 44.0	° 36.0	° 59.12	22.86	W. W. Hays, Surgeon, U. S. Army.
Sacramento.....	54	° 38.31	° 121.29	20 "	° 94.0	° 62.0	° 32.0	° 60.25	20.06	Thos. M. Logan, M. D.
Marysville.....	76	° 39.12	° 121.42	1 "	° 90.0	° 38.0	° 52.0	° 63.32	.....	W. C. Belcher, 1858.
Fort Reading.....	674	° 40.31	° 122.05	4 "	° 83.0	° 44.0	° 39.0	° 62.09	29.02	Army Met. Reg., 2 years, partially.
Aurora.....	7,488	° 38.19	° 119.00	1 "	° 82.0	° 20.0	° 62.0	° 52.00	.....	Major Williamson, U. S. Army.
Hope Valley.....	7,088	° 38.47	° 119.54	4 mos.	° 61.0	° 11.0	° 40.0	° 40.00	.....	Major Williamson, U. S. Army.
Strawberry Valley.....	7,710	° 38.49	° 120.07	3 "	° 69.0	° 24.0	° 35.0	° 51.00	.....	Major Williamson, U. S. Army.
Fort Jones.....	2,570	° 41.36	° 122.52	3 years.	° 71.0	° 31.0	° 40.0	° 51.40	16.77	Army Met. Reg., 2 years, partially.
Astoria.....	50	° 46.11	° 123.48	18 mos.	° 62.0	° 39.0	° 23.0	° 50.20	86.35	Budget and Williamson.
Fort Orford.....	50	° 42.44	° 124.29	4 years.	° 61.0	° 46.0	° 15.0	° 53.62	71.63	Army Meteorological Reg., partially.
Red Dog (Nevada).....	2,900	° 39.18	° 120.47	4 "	.....	.....	.....	.....	83.30	W. A. Begoli, 1861, 1862, 1863, 1864.
Nevada.....	2,630	° 39.18	° 120.52	1 "	° 72.0	° 45.0	° 27.0	° 55.75	.....	J. McCoy, County Assessor.
Shingle Springs (El Dorado).....	1,450	.....	.....	1 "	.....	.....	.....	.....	50.30	John Edwards, M. D.
Vacaville (Solano).....	.....	° 38.20	° 122.00	1 "	.....	.....	.....	° 53.25	24.18	Professor J. C. Simmons.
Stockton.....	23	° 37.37	° 121.14	18 mos.	° 86.0	° 37.0	° 49.0	° 66.03	4.75	Eng. Depart. C. P. R. R., 1870-71.
Niles.....	87	° 37.15	° 121.52	18 "	° 91.0	° 41.0	° 50.0	° 66.03	7.45	Eng. Depart. C. P. R. R., 1870-71.
Livermore.....	485	° 37.27	° 121.26	18 "	° 72.0	° 41.3	° 30.7	° 56.06	.....	Eng. Depart. C. P. R. R., 1870-71.
Chico.....	150	° 39.46	° 121.26	18 "	° 86.7	° 62.0	° 47.7	° 62.89	17.65	Eng. Depart. C. P. R. R., 1870-71.
Auburn.....	1,363	° 38.57	° 121.50	18 "	° 92.3	° 34.0	° 55.3	° 64.67	17.65	Eng. Depart. C. P. R. R., 1870-71.
Colfax.....	2,421	° 39.03	° 120.55	18 "	° 91.0	° 34.3	° 56.7	° 62.75	17.65	Eng. Depart. C. P. R. R., 1870-71.
Reno.....	4,507	° 39.31	° 120.55	18 "	° 91.7	° 33.3	° 58.4	° 62.66	30.80	Eng. Depart. C. P. R. R., 1870-71.
Santa Barbara.....	300	° 34.31	° 119.38	12 "	° 82.0	° 18.0	° 64.0	° 50.00	2.31	Eng. Depart. C. P. R. R., 1870-71.
									15.00	J. A. Johnson.

## COAST CLIMATE.

The climate of San Francisco may be regarded as representative of the immediate coast. No other place in the temperate zone has a temperature so equable and mild. The trade winds blow strongly and steadily from the northwest through the summer and through much of the winter, striking the coast with the temperature of the cold current of the ocean that averages from forty-five to fifty-five degrees, cold enough to chill invalids, but invigorating to the health and peculiarly favorable to mental and physical activity, mostly on account of the ozone with which they are laden. The cold oceanic winds are felt on the coast through the summer, north of thirty-four degrees and thirty minutes, but there Point Conception juts out and shelters the southern coast, so the climate is much warmer.

## INTERIOR CLIMATE.

As we go inland the temperature changes. At Vallejo, fifteen miles farther from the ocean than San Francisco, the temperature is ten degrees warmer in July and two degrees colder in January; while in Sacramento, some seventy miles further from the ocean, in a direct line, the mean temperature is forty-six degrees in January, and in July, seventy-three. While the difference is eighty degrees in San Francisco, between midsummer and midwinter, it is twenty degrees in Benicia, and twenty-eight degrees in Sacramento. Through a large gap in the Coast Range the oceanic winds temper the heat of summer at the latter place, which rises to ninety degrees, in July, at Millerton, and to eighty-two degrees at Red Bluff—places no farther from the sea, and about the same level.

## MOUNTAIN CLIMATE.

As we ascend into the mountainous parts of the State the coldness of the winter increases. At an elevation of two thousand feet, snow frequently covers the ground for several days at a time; at four thousand feet snow lies for weeks, and at six thousand feet it continues for months. At Howland Flat, in Sierra County, one of the points enumerated in our Odd Fellows' table, about six thousand five hundred feet above the sea, the snow is sometimes twenty feet deep. At Hope Valley, seven thousand and eighty-eight feet above the sea, as will be seen in our table, the coldest mean day is only eleven degrees, while the mean temperature is not less than forty degrees. Even at our highest summits, of more than fourteen thousand feet of elevation, the snow does not lie in great quantities, except in winter.

From the observations thus recorded, respecting the grand climatic divisions of the State, which have been made for the purpose of systematic description, some general idea may be formed of the local differences of climate alluded to, the shades of difference being caused chiefly by the great equalizing power of the ocean and the greater or less exposure to it. The Pacific winds are very nearly calculable quantities, and by them are determined to a great degree the temperature of places, the rains, the growths also, as respects both their rates and kinds, and the almost uniform salubrity. The nearer the Pacific, the denser and more frequent the fog, the stronger the winds, the warmer the winters, and the cooler the summers. In fact every degree of temperature, from the heat of

the torrid zone to a chilling cold, can be found at short distances from each other near the level of the sea.

A common error into which people generally fall, when forming an opinion on climate, is to consider it as synonymous with temperature. The climate of a place, considered in relation to its influence on health and disease, may be said to be, the impression produced on the human body by the superincumbent atmosphere, according to the extent to which it is charged with heat, moisture and electricity; its purity, pressure, and the amount of ozone which it may contain; the force and direction of the prevailing winds, and the annual rain fall—all of which circumstances are greatly modified by the physical conformation of the locality, its latitude and longitude, its aspect, the geological formation of the soil, the properties of the waters, the altitude and position of the nearest mountain ranges and its situation in reference to the ocean.

As a contribution, in part, to a knowledge of all these circumstances, we have brought together such facts and positive information as we have been enabled to gather, hoping that they may prove the means of affording an opinion, approximating to correctness, of the several points partially reported upon. There is yet one more feature of the climate of California to which we would particularly call attention, and that is its general dryness.

#### RAIN FALL.

To the public spirit of the President of the Central-Pacific Railroad Company we are indebted for the accompanying chart of the rain fall on the line of the road and its vicinity, through California, Nevada and Utah, based upon data compiled by the engineer department, from August, eighteen hundred and seventy, to July, eighteen hundred and seventy-one. It represents a comparatively dry season, but the proportionate amount of precipitation in the great valley region and in the mountains is well maintained. As a general rule, the western sides of the mountains, against which the rain clouds are blown from the ocean, catch more rain than the eastern, and this fact is clearly demonstrated on the chart. If the mountains are very high, all the moisture may be precipitated, on this side from the clouds. Thus, it has been stated, that in Inyo County, where the Sierra Nevada reaches an elevation ranging from ten to fifteen thousand feet, not one-fourth so much rain and snow fall on the eastern as on the western slopes at equal altitudes.

Nearly all the rain falls between November and March, inclusive, there generally being an interregnum about the month of February during a rainy season (for some years little or no rain falls at all), between the former and the latter rains. The rest of the year continues rainless and dry; and such is the tendency to dryness in the air, that complete saturation, as demonstrated by the wet and dry bulb thermometers, has never been observed at Sacramento during the most rainy seasons. A large proportion of the rainy season, in average years, is made up of clear, sunny days.

#### SANITARY RETREATS.

In presenting the following articles on the medical topography of two of the chief health resorts in the southern part of the State, which have been contributed for the purpose of conducing to an intelligent selection of a sanatorium for valetudinarians, we would commend for them a careful perusal, while reiterating the opinion already advanced, that the geological formation and configuration of a locality has a very great

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Date.	Births.	Deaths.	Marriages.
Brought forward.....	1,594	463	264
1844.....	56	20	3
1845.....	61	14	13
1846.....	72	16	19
1847.....	70	20	5
1848.....	68	25	11
1849.....	64	43	9
1850.....	67	20	25
1851.....	67	28	21
1852.....	81	33	25
1853.....	108	35	24
1854.....	90	46	19
1855.....	106	47	21
1856.....	107	36	15
1857.....	60	31	13
1858.....	116	42	11
1859.....	94	57	19
1860.....	127	49	18
1861.....	94	68	12
1862.....	120	43	16
1863.....	114	41	13
1864.....	105	54	10
1865.....	78	40	13
1866.....	108	52	13
1867.....	105	41	17
1868.....	108	39	23
1869.....	117	70	32
1870.....	138	47	23
Total.....	4,090	1,520	707

[Addenda by the Secretary of the State Board of Health]

#### VITAL STATISTICS.

It will be seen from the above that for each death there have been two and two-thirds births—an unusually large proportion as compared with other places. Another point of interest is the marked increase of the death ratio during the last twenty years; due, doubtless, to the advent of adventurers and invalids. In addition to long life, these statistics show that to each marriage there is an average of about five and two-thirds children, an unprecedentedly large proportion.

The following statistics of the Town and County of Santa Barbara are taken from the United States census returns for this county, for the year ending June first, eighteen hundred and seventy, and speak more for the healthfulness of the place than anything I can add.

Population of the town, two thousand nine hundred and eighty-seven; number of births, one hundred and thirty-one; deaths of children under one year of age, nine; ratio of births to deaths, fourteen and one-half to one; total number of deaths, including adults, for same period, twenty-

three; ratio of births to deaths for the whole population, five and seven-tenths to one, or nearly six to one; percentage of deaths in the town populations, one in one hundred and thirty, or seventy-seven one-hundredths of one per cent.

Population of the county, seven thousand nine hundred and eighty-four; number of births same period, two hundred and thirty-five; total number deaths of children under one year of age, fifteen; ratio of births to deaths, fifteen and three-quarters to one, or nearly sixteen to one; total number of deaths in the county, sixty-four—two accidental; percentage of deaths in total population, one in one hundred and twenty-five, or eighty one-hundredths of one per cent.

#### METEOROLOGY.

The peculiar evenness of the climate is shown in the following tables, compiled from the meteorological register of the Reverend J. A. Johnson, the indefatigable editor of the *Santa Barbara Press*:

##### *Thermometer monthly mean—1870-71.*

April.....	Average of the three daily observations.....	60.62
May.....	Average of the three daily observations.....	62.35
June.....	Average of the three daily observations.....	65.14
July.....	Average of the three daily observations.....	71.49
August.....	Average of the three daily observations.....	72.12
September....	Average of the three daily observations.....	68.08
October.....	Average of the three daily observations.....	65.96
November....	Average of the three daily observations.....	61.22
December....	Average of the three daily observations.....	52.12
January.....	Average of the three daily observations.....	51.51
February.....	Average of the three daily observations.....	53.35
March.....	Average of the three daily observations.....	58.42
Average temperature for the year.....		60.20

Coldest day.	Degrees.	Warmest day.	Degrees.
April 12th.....	60	April 16th.....	74
May 15th.....	66	May 23d.....	77
June 1st.....	69	June 3d.....	80
July 26th.....	76	July 11th.....	84
August 11th.....	77	August 8th.....	86
September 23d.....	66	September 27th.....	90
October 23d.....	60	October 20th.....	92
November 7th.....	64	November 20th.....	87
December 15th.....	52	December 28th.....	71
January 11th.....	56	January 3d.....	76
February 22d.....	42	February 28th.....	71
March 13th.....	56	March 27th.....	83

Coldest day in the year, February twenty-second, forty-two degrees ; warmest day in the year, October twentieth, ninety-two degrees. Range fifty degrees.

*Monthly mean of relative humidity and force of vapor.*

	Rel. humidity.	Force of vapor.
April, 1871.....	62	.317
May, 1871.....	59	.376
June, 1871.....	74	.406
July, 1871.....	75	.509
August, 1871.....	79	.543
September, 1871.....	78	.483
October, 1871.....	68	.420
Mean of 7 months.....	70	.436

SANTA BARBARA AS A SANATORIUM.

The following article from the pen of Dr. S. B. Brinkerhoff, is from the *Santa Barbara Press* of April fifteenth, eighteen hundred and seventy-one :

During the eighteen years in which I have been engaged in the active practice of medicine in Santa Barbara, I have received numerous letters from persons residing at a distance, making inquiries concerning the climate of this place, and its remedial effect upon various diseases. Replying to these inquiries has often imposed upon me no small amount of labor, and required more time than I could well spare in the proper discharge of other duties. To answer briefly and yet comprehensively enough to cover almost every case where similar inquiries may be made, has induced me to state some facts, based mainly upon my own observation and experience as a practising physician, trusting they may reach, through the columns of the *Press*, many persons desirous of some information relative to the climate of Santa Barbara and its advantages as a place of resort for invalids. That a region so great in extent as the State of California, stretching across so many degrees of latitude, and possessing such a variety of climate, produced or modified by the diversity of ocean, valleys, hills and mountains, should possess some locations more favored in respect to general healthfulness than others, it would be natural to suppose.

Having myself moved from the East to California in pursuit of health ; having resided in different portions of the State before locating in Santa Barbara, where my health has been restored ; having devoted considerable attention to the study of the peculiarities of climate in respect to its influence upon health, and having frequently been consulted professionally by invalids, who have resorted here in search of health, and observed the apparent effect of the climate in contributing to their restoration, I think I am prepared to speak advisedly of the superiority of the climate of Santa Barbara, and of the very favorable advantages which this place affords as a resort for invalids. And, in this connection, it may not be

remiss to add that the number of inhabitants of Santa Barbara Township, among whom my practice has been continuous, as given by recent United States census, is four thousand two hundred and eighty, many of whom came to this place for their health, and have since taken up their residence here.

To the peculiar location and surroundings of Santa Barbara I attribute mainly its superior healthfulness. The direction of the sea coast bordering the County of Santa Barbara, for upwards of a hundred miles, is nearly east and west. The so-called Valley of Santa Barbara extends along the coast for a distance of about twenty-five miles, varying in width from one to three miles, and is shut in upon the north by the Santa Ynez range of mountains. The Town of Santa Barbara is pleasantly located nearly midward of this valley, overlooking the ocean on the south, and bounded on the northeast and west by a range of sparsely wooded hills, which give a pleasant diversity to the landscape, and serve to temper the force of the winds. About twenty miles to the southward are the Islands of Santa Rosa, Santa Cruz and Anacapa, rising from the ocean at many points to the height of twenty-five hundred to three thousand feet, which form the Santa Barbara channel, and serve to shield the town from the violence of ocean winds. It is protected from northern blasts by the Coast Range of mountains, which average from three to four thousand feet in height. The heat of summer is tempered by gentle breezes from the sea, the average summer temperature being less than seventy degrees. The average winter temperature is fifty-three degrees. The changes in the seasons are scarcely perceptible in temperature. Frosts are of rare occurrence, and disagreeable fogs seldom prevail. There are but comparatively few days in the entire year when one cannot sit out of doors, during the day, without discomfort. The nights are always cool and sleep-inviting. The sandy and gently sloping beach for several miles affords an excellent and perfectly safe place for sea-bathing at all seasons of the year, and at low water, an admirable place for pleasure driving. There are also pleasant drives into the country, both up and down the valley. Within a few miles from town there is game for the sportsman, trout fishing in the mountain streams, and sea fishing in the channel.

The softness and general uniformity of the climate, its freedom from dampness and sudden changes, the opportunity for diversion and recreation, render Santa Barbara pre-eminently a desirable place of resort for persons suffering from bronchial and pulmonary affections. Although many persons suffering from these complaints have come here too late to receive any permanent relief from the restorative effects of the climate, yet the greater portion of cases which have come under my observation, have been permanently relieved, and many in a surprisingly short space of time have been perfectly restored to health. That the climate of Santa Barbara possesses elements of general healthfulness in an eminent degree, and perhaps also some latent peculiarities in its favor too subtle for ordinary observation, I may instance the following facts in this connection: During the eighteen years of my active practice here, I have never known a single case of scarlet fever or diphtheria. I have known of only three cases of dysentery, neither of which proved fatal; and only of three cases of membranous croup. The epidemics and diseases incident to childhood, which in other parts of the country sweep away thousands of children annually, are here comparatively unknown.

Cases of fever and ague I have never known originating here, and persons coming here afflicted with it, rarely have more than two or three attacks, even without the use of anti-periodics. I have known instances of small-pox at three different times. In each of the first two instances, occurring several years apart, the disease was confined to a single case and was contracted elsewhere. Neither of these cases proved fatal. In the year eighteen hundred and sixty-four, when this disease prevailed so extensively and proved so fatal throughout the State, there were two cases of the disease contracted elsewhere and developed here, both of which proved fatal. Three other persons residing here contracted the disease from contagion at this time, all of whom recovered. Although no unusual precaution was taken to prevent the spread of the disease, it was confined to the cases mentioned. Yet hundreds of the native population, either from ignorance or prejudice, had never been and would not suffer themselves to be vaccinated. In the years eighteen hundred and sixty-nine and eighteen hundred and seventy, when this disease in its most virulent form prevailed so generally throughout the State, not a single case occurred at Santa Barbara, although in daily communication with other parts of the State by stage and steamer.

Some ten miles from Santa Barbara, in a westerly direction, in the bed of the ocean, about one and a half miles from the shore, is an immense spring of petroleum, the product of which continually rises to the surface of the water and floats upon it over an area of many miles. This mineral oil may be seen any day from the deck of the steamers plying between here and San Francisco, or from the high banks along the shore, its many changing hues dancing upon the shifting waves of the sea, and affording various suggestions, both for the speculative and the speculator. Having read statements, that during the past few years the authorities of Damascus and other plague-ridden cities of the East have resorted to the practice of introducing crude petroleum into the gutters of the streets to disinfect the air and as a preventive of disease, which practice has been attended with the most favorable results, I throw out the suggestion, but without advancing any theory of my own, whether the prevailing westerly sea breezes, passing over this wide expanse of sea-laden petroleum, may not take up from it and bear along with them to the places whither they go, some subtle power which serves as a disinfecting agent, and which may account for the infrequency of some of the diseases referred to, and possibly for the superior healthfulness of the climate of Santa Barbara.

About four miles from Santa Barbara, pleasantly located in one of the cañons of the mountains, are the Hot Sulphur Springs, which have become favorably known as a place of resort for invalids. I do not regard the use of these waters by any means as a panacea for all "the ills which flesh is heir to," but for the cure of certain diseases they are remarkably efficacious. I have known some cures which seemed to defy all powers of medication, cured permanently, in a surprisingly short space of time by the waters of these springs advisedly used as a beverage and for bathing purposes. The indiscriminate use of them may be disadvantageous and even positively injurious, and, before resorting to them, patients should always consult some experienced physician as to their proper use.

I am informed upon good authority that while the country was subject to the crown of Spain the Spanish Government sent out a commission of skilled and scientific persons to make an examination and analysis of the different mineral springs, both in Mexico and upon the Pacific coast, and that this commission, after spending much time and making

a very thorough examination of the water of all similar springs, reported the most favorably of the medicinal virtues of these springs. I would advise patients coming here in search of health to remain comparatively quiet for a short time after their arrival, as very often invalids, feeling themselves so immediately improved by the change of climate, are stimulated to over exertion, and are seriously injured in consequence.

Some invalids will find it desirable to select their residence while here where they can enjoy the advantages of sea bathing. In some cases they derive more benefit by seeking a higher altitude, which can easily be obtained within a short distance of the town, where comfortable accommodations can be secured. The matters of pleasant location, diet, exercise and recreation are all important to the invalid, and upon a proper regulation and observance of the same, as well as the influences of a favorable climate, may greatly depend his speedy recovery.

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## MEDICAL TOPOGRAPHY, ETC., OF SAN DIEGO COUNTY.

*Abstract of Report to the State Medical Society, by D. B. Hoffman, M. D*

San Diego is situated on the eastern shore of San Diego Bay, nine miles from its entrance, in latitude thirty-two degrees thirty-nine minutes and eleven seconds north, longitude one hundred and nineteen degrees twenty-one minutes and three seconds west. The shape of the bay is not unlike the form of the Greek letter *Upsilon*, divided through its middle, perpendicularly—the short disc representing the mouth, or entrance, and the extremity of the long arm the head. The bay is about twenty miles long, and, on an average, two and a half miles wide.

The eastern shore of the bay is generally low, rising slowly, as it recedes back, inland. The soil on the shore is fertile, and where not cultivated is covered with a dense growth of chapparal and luxuriant grass. The western shore is a narrow belt or spit of sand hills, except near the mouth of the bay, where it widens out, and forms what is called "The Island." This island is principally sand, but, in favorable years, good crops of grain have been produced on it. Where it is not cultivated a good growth of wood is flourishing. Considerable quantities of wood and grass can also be found scattered over the "spit" at intervals. The site of the barracks is very handsome. It is a gentle plateau, sloping gradually down to the beach. On the west are the waters of the bay and the broad blue ocean. On the east a high and noble chain of mountains, whose tops are covered with fine forests of pine and oak, can be seen. The post buildings, officer's quarters, hospitals, etc., are located near the shore of the bay, and are large fine frame structures, with all the modern improvements, suitable to a warm and delightful climate. Everything, in this respect, could not be better for the health or comfort of the men and officers; and I have no hesitation in saying that this is the only proper place on this coast for the General Hospital of this Department.

San Diego County extends across the southern extremity of the State of California, and contains about thirteen thousand square miles. A broad belt, lying along the coast, is adapted to agricultural, horticultural and grazing purposes. The Coast Range, with its numerous spurs, runs through the whole length of the county, and constitutes an exter

mountain district, well supplied with timber, and known to contain a great variety of minerals.

There are also many beautiful valleys in this district, well adapted to the raising of wine, grain, cattle and sheep, which, at no distant day, must be settled by a happy and prosperous rural population. The Colorado desert, level and shrubless, stretches eastward from the mountains to the Colorado River. It lies below the level of the Gulf of California, the waters of which are believed to have covered it at a former period.

The harbor of San Diego is one of the safest and most commodious on the coast. The range of mountains that runs diagonally through, about the centre of this county, from the northwest to the southeast, has a general elevation of from twenty-eight hundred to four thousand feet above the level of the sea. The eastern slope is, for the most part, precipitous and rugged, while the western has a more plateau-like gentle declivity. The lower ranges are covered with various kinds of oak (*quercus alba*, *q. tinctoria*, *q. falseta*) and other kinds of hard wood trees, commonly found in countries of this latitude; while the sunnits of the more lofty piles have immonse pines (*pinus palustris*, *p. abies*) covering them, which, at no distant day, will be valuable for building homes and navies for this part of the world.

There are no rivers or lakes in the county of any size or note. In fact, the Rio Colorado of the West, which is the eastern boundary of the county, is the only prominent stream to be found of any size. There are several other streams that answer navigable purposes in the wet or rainy season, and, at this time, frequently interrupt all communication for weeks; but during the summer or dry season are completely absorbed by the extensive beds of silicious sand of which their bottoms are principally composed. To make up, however, for this great and necessary want of a country, we have thousands of lagoons, living springs and running rivulets, plentifully distributed all over that portion of the county west of the desert. The lagoons are generally of good size and deep, affording a large supply of wholesome water for irrigation or stock, and seldom dry up. Many of the rivulets, especially in the mountain districts, are sufficiently large for mill purposes. The springs are large, and when protected by a curb afford excellent and voluminous supplies of wholesome water.

#### GEOLOGY.

There can scarcely be a doubt that the whole of this country is a region of volcanic origin. On the desert, to the east of this place, there is at work even at this day volcanic action; hot water and mud are frequently ejected to the height of several feet; steam and other vapors are continually emitted from numerous springs in the ground. The mountains and ravines, especially where the rocks jut out and overhang, disclose strong evidence of igneous action, although the valleys and table lands are of a sedimentary formation. The alternate mountain ranges, plains, valleys and table lands into which the surface is divided are the results of these opposite agencies. One-fourth of these lands can be made, by irrigation, valuable for agricultural and horticultural purposes. One-half is as good natural grazing land as there is in the world, and is particularly adapted, both in climate, food and range, to the raising of sheep, leaving only one-fourth of the whole surface as waste land. This is a much smaller proportion than many other populous and prosperous countries have; and even large portions of this, now covered with a dense growth of chaparral, is composed of

a rich and fertile soil, which could be reclaimed with much less labor than it takes in other countries to reclaim swamp and heavy timber tracts. The sterility of these lands is owing more to a want of moisture than poverty of soil. Experiments show that, with proper irrigation and cultivation, these lands are capable of growing excellent crops of cereals and other produce, as well as fine grapes and fruit. Thermal springs abound all over the country, and one of them, situated on Warren's Rancho, is a great resort for invalids. Bathing in and drinking its water is said to cure rheumatism in all its varied forms, and cause sterile women to bear children. The country people believe religiously the latter statement, and, if one could rely upon reports, there are some well-authenticated cases to prove it. But, as I have never examined the matter, I am unable to speak truthfully in relation to the same. Both useful and precious metals exist here in limited quantities. Indications of gold, silver, copper, lead, tin, iron, platina and coal have been found in different sections of the county, and some of the gold mines have been worked profitably. Limestone, granite, hornblende, decomposed quartz and red sandstone, with now and then a ledge of marble, are frequently found in the mountain districts. In many places along the coast millions of tons of pure white sand can be found, which will be in time valuable for building purposes, as it is the kind and quality sought after for making mortar.

#### METEOROLOGY AND CLIMATOLOGY.

Strictly speaking, we have but two seasons—the wet and dry. Usually, the wet season sets in about the twentieth of November and ends on or about the twentieth of April. This, in common parlance, is called the winter season, not because it is cold, but simply because it is wet, or a change from the summer season. During this time there usually falls about eight inches of rain; never any snow, except on the mountains, which are occasionally covered with it for a few days at a time. During the time that they are “snow capped” the winds are very violent, cold and high, and in consequence, the changes in the temperature are sudden and disagreeable. The summer is generally very equable. The heat throughout the day is steady, seldom rising above eighty degrees, and the nights are always cool enough for winter bedding. Our climate, along the coast, is so very mild, healthy and equable that we seldom have a frost that does any damage, except, perhaps, now and then to the more tender plants. Everything in the shape of vegetables and fruit ripens here without the least trouble or hinderance from this cause. In the mountains, of course, it is somewhat colder, but I believe it rarely freezes sufficiently to form ice any where there, in the habitable altitudes. For health and pleasure there is probably not a better climate on the globe than we enjoy.

#### DISEASE.

For nearly two years the command stationed at this port has been so healthy that there has not been a natural death from disease. During this time one man was shot for mutiny, and another was accidentally drowned while out sailing in a small boat on the bay. The primary diseases of this locality are fevers and rheumatism. Of the former, we occasionally have all of the different types; but I think, from my experience, the bilious remittent type is more prevalent than any other. All fevers here are of the asthenic character, and, in most c



when attended to in time, yield to the usual remedies. Rheumatism seems to be indigenous to the soil, every one complaining of it, more or less. It is probably owing to the humidity of the atmosphere along the coast that causes this disease. However, it is seldom fatal, and usually quickly yields to ordinary treatment. Wearing flannel next to the skin the year around, is a sure prophylactic. During the fall months, when fruit is largely eaten by the population of this county, diarrhœa and dysentary prevail; but it is generally of a mild type, and readily succumbs to treatment. Of the whole number of cases treated, more than two-thirds have been of a venereal character. This loathsome and disgusting disease is rendered prevalent by the pernicious intercourse of the men with the dirty, filthy, low, drunken squaws, which infest the locality of the town and camp. Syphilis and gonorrhœa, contracted from these low Indian squaws, is always of the most virulent type, particularly gonorrhœa, which sometimes defies all treatment for months.

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### METEOROLOGY OF SAN DIEGO.

*By G. W. Barnes, M. D., in a letter to the Secretary.*

Agreeably to promise, I inclose synopsis of meteorological observations since December first. The winter has not been so favorable for invalids as the last preceding one. Older residents differ greatly in their recollection of past seasons, but the weight of testimony is that unusual atmospheric conditions have prevailed during the last three months. Chest affections improved until February, since which time fresh breezes, more or less harsh and chilling, have been more common. A few cases of pneumonia occurred in February and March. A portion of March was very fine, but April was the most unpleasant month. There were, in the fall, a number of cases of remittent fever, but for the last two months there has been a remarkable absence of acute disease. My impressions thus far are that this climate is, in the main, well adapted to persons suffering from lung diseases, unfavorable influences being exceptional, but for the most part of the time a locality fifty or more miles inland, would be more suitable. As yet the country is unsettled and accommodations lacking, but I have no doubt the construction of the Texas Pacific Railroad will render some of the best climatic conditions to be found on the coast available.

Meteorology of 5 months.	1870. December.	1871. January.	1871. February.	Winter.	1871. March.	1871. April.
Mean temperature.....	52.08	52.90	51.91	52.29	57 00	58.82
Mean temp. at 7 A. M...	45.90	46.06	45.59	45.85	51.67	56.00
Mean temp. at 2 P. M...	61.09	62.06	60.85	61.33	66.37	65.85
Mean temp. at 9 P. M...	49.25	50.60	49.37	49.74	52.98	54.60
Mean temp. hottest day	57.33	62.33	57.50	62.33	67.00	66.83
Mean temp. coldest day	46.33	43.66	48.33	43.66	51.83	52.66
Maximum temperature.	70.00	74.58	69.50	74.58	86 50	76.00
Minimum temperature..	38.00	33.00	39.00	33 00	43.00	46.00
Mean daily range.....	15.48	15.95	15.55	15.66	15.51	12.33
Greatest daily range...	27.00	27.00	27.50	.. .....	32.00	23 50
Highest temperature of evaporation.....	59.0	60.0	64.0	.....	65 0	64.0
Great. dif. air and evap.	14.0	17.0	17.0	.....	27 0	16.0
Mean rel. hum'y 7 A. M.	.....	.....	89.0	.....	80.9	86.3
Mean rel. hum'y 2 P. M.	54.0	57.0	67.0	.....	58.7	59.1
Mean rel. hum'y 9 P. M.	.....	.....	90 0	.....	79.9	84.7
Mean force vapor 7 A. M.	.....	.....	.274	.....	.311	.387
Mean force vapor 2 P. M.	.272	.316	.349	.....	.370	.372
Mean force vapor 9 P. M.	.....	.....	.319	.....	.320	.360
Lowest rel. humidity...	31.0	26.0	22.0	.....	11.0	34.0
Lowest force of vapor..	.146	.130	.138	.....	.140	.207

*Table of Mortality in San Diego City and County for the Year ending June 30th, 1871. By T. C. Stockton, M. D., Secretary of the San Diego County Medical Society.*

CAUSES OF DEATH.	Whole number.....	OCCURRING IN AGES BETWEEN							SEX.		COLOR.		Married.....	Single.....	NATIVITY.			DIED IN	
		Birth and 1..	1 and 5.....	5 and 10.....	10 and 20....	20 and 30....	30 and 40....	40 and 50....	50 and 60....	60 and 70....	Males.....	Females.....			U. States.....	Foreign .....	Unknown....	City.....	County .....
Apoplexy.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....	1	.....	1	.....	.....	1	.....
Brain, softening of.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....	1	.....	1	.....	.....	1	.....
Bronchitis.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Consumption.....	16	.....	.....	.....	.....	.....	.....	.....	.....	.....	16	.....	.....	.....	12	1	3	11	5
Croup membranous.....	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
Delirium tremens.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
Diarrhoea.....	4	2	1	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	3	1	.....	4	.....
Dropsy.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Enteritis.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fever, intermittent.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fever, typhoid.....	4	.....	.....	2	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fever, typhus.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Fistula in ano.....	1	.....	.....	.....	.....	.....	.....	1	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
Hydrocephalus.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Paralysis.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pneumonia.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
Poisoned.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Post partum hemorrhage.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Premature birth.....	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Scrofula.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Suffocation.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Whooping cough.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Accidents from negligence and violence.....	9	.....	1	.....	1	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unknown.....	4	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
<b>Totals.....</b>	<b>60</b>	<b>10</b>	<b>4</b>	<b>3</b>	<b>10</b>	<b>11</b>	<b>11</b>	<b>11</b>	<b>1</b>	<b>1</b>	<b>39</b>	<b>21</b>	<b>59</b>	<b>1</b>	<b>18</b>	<b>42</b>	<b>11</b>	<b>7</b>	<b>40</b>

few explanations should accompany this table. The mortality of *city* as given in this view is correct, but for the *county*, it is not as complete as would have been desirable. No doubt there have been some deaths in county districts which have not been included. Respecting deaths by "violence," it will be observed that there is but one accredited to the city, the remainder belonging to the country. Our readers are familiar with the series of mysterious murders, charged to Indians, and mostly of bachelors living in solitary cabins, which make up the remaining eight. Concerning the fever here called the "typhoid," it could be stated that it is so designated for lack of a better name, and because it conforms at all closely to the regular typhoid. It is more like the "mountain" fever of Arizona.

But, especially, notice should be taken of the *sixteen* deaths by consumption. This will be understood. Dr. Holmes says that the best doctors lose the most patients; not only because they *have* the most, but because the worst come to them, and their own do not easily abandon them. It is so with a pulmonary health resort. *Eleven* of the above consumptives came to San Diego in the last stages of the disease, and died very soon after arriving. Over against this list we propose to set, some day, a list of those now residing among us who came here early enough to experience the benefits of the climate. Moreover, it could be shown, in several of the above cases, that the patient not only arrived so late, but recklessly expected the climate to do everything for him, without his using even the ordinary precautions besides.

With these just explanations, the table is a most satisfactory one. The population of the town, according to the last census, was two thousand and three hundred and one, and this is believed to be about the average population for the year here represented. Total number of deaths in the town, forty; which gives a percentage of 17.38 deaths to every one thousand of population. But out of this should be taken the above *eleven* deaths (of consumption) and one accidental death. This gives us twenty-eight deaths, or a percentage of 12.16 deaths to every one thousand of population, as the correct mortality of the year. Respecting this, we can only say, in brief, that it is unprecedented. No statistics so accurate as these ever before presented so small a death rate.

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## CONCLUSION.

It is a cause of regret, that the limited time between the final adoption of this report by the Board, and the expiration of the term of office of the State Printer who had the matter in charge, has prevented us from giving a more complete synopsis of its contents, and thus to compensate in some degree for the want of a rigidly methodical manner of treating the various subjects embraced therein. Partly for reasons just stated, and partly on account of the sudden indisposition of our President, who had the matter in charge, the proposed article on the use of intoxicating liquors is omitted in the present report. In the meantime, Dr. Gibbons will hold himself in readiness to impart the result of his long and studious application to the subject, should it be so

desired during the present session of the Legislature. We have not the remotest idea, however, that any legislation will be deemed advisable in the premises.

We submit, in concluding this report, that, while endeavoring to comply with the requisitions of our organic law, we have adhered as closely as possible to the headings of the various topics that have come under consideration, and have made out a case showing the paramount necessity for a liberal, yet carefully digested system of sanitary legislation, and the importance of adopting such a code, as is herewith recommended, for the harmonious working of the various branches of sanitary police, and consequently for the more effectually accomplishing the ends and purposes for which the State Board of Health was created.

All of which is respectfully submitted,

THOS. M. LOGAN, M. D.,  
Permanent Secretary State Board of Health.

SACRAMENTO, CAL., November 1st, 1871.

# APPENDIX.



## FEMALE HYGIENE.

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A LECTURE DELIVERED BY REQUEST OF THE CALIFORNIA STATE BOARD OF HEALTH, AT SACRAMENTO, ON THE 28<sup>TH</sup> APRIL, 1871, AND AT SAN FRANCISCO, ON THE 25<sup>TH</sup> MAY, 1871.

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By HORATIO R. STORER, M. D., OF BOSTON, MASS.

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To a tired man, just preparing for a month's respite from constant and harassing care, by crowding that month's work in advance into the busy weeks preceding it, there came most unexpectedly Dr. Logan's kind request to add an Alp to the already too heavy burden. The very idea of preparing for delivery, under the auspices of the California State Board of Health, a lecture upon Female Hygiene in any way worthy the intrinsic importance of the subject, seemed like raising for the traveller a far more impassable barrier betwixt Boston and Sacramento than would once have been the dizzy heights, the floods, the wilderness, that intervene.

I confess then, frankly, the reluctance with which I have assumed this task, and my conviction that in its performance I shall be found to fall far short of what you, perhaps, may think that you have the right to expect. I have undertaken it simply because, anticipating so much pleasure during my short stay in your State, it seems my duty to accept the opportunity now given me, of endeavoring to make some slight return.

No person can reach adult age without becoming impressed, very often painfully so, by the belief that there are very different factors underlying the hygienic conditions of men and women; inherent elements, surely governing, and producing results that in the case of the gentler sex, to whom only we are now to give attention, are favorable under certain circumstances, extremely unfavorable under others; and then, disastrous not merely to the individual but, in one way or another, to the wide circle of persons who may be within her immediate influence, and at times, however indirectly, to the whole community.

The effects referred to, comparing the health of one man with that of one woman, or of any number of hundreds or thousands of the first with an equal array of the other, are far greater, proportionately, in the case of the woman. That is to say, while,



*First*—Women are naturally more exquisitely delicate in their physical organization than men, more acutely sensitive to all emotional agencies, different in the very character of their intellect as well as in its methods of thought, and far more spiritual—to use the term as expressive of a nearer approach to the source of all that is pure and angelic—and while,

*Second*—Women are prone to a thousand physical ills and disturbances, many of them very severe, and some of them as yet practically incurable—the foundation, each and every one of them, at times, of mental disorder as well (in itself far more lamentable than the direst form of bodily suffering)—of which men, practically and from their own personal experience, do know and can know comparatively nothing.

*Third*—The health of women is much more liable to grave derangement from strictly hygienic cause than that of men.

It is of this latter fact, and of this alone, that I have to speak to you. I shall point out some of its more prominent illustrations, and, suggesting briefly what needs to be done for relief, and for prevention, which is always so much better than cure, I shall have done well if my words prove to the people of your State seed that in its fertile soil may bring the harvest quicker and more abundantly than can obtain in those icy and sterile older regions whence so many of you have come to the American Canaan.

I shall have to speak very plainly, and must verge upon matters that, perhaps because they affect the best interests of society, are too often unwisely left to an unbridled imagination, wholly ignorant of the simplest laws of sanitary science. I shall trust, however, not to offend even the most delicate ear, and to carry conviction of the infinite importance of what I shall speak of to each and every one of you.

But, it is possible that I may be asked, is it really true that women, like those treasures of finest workmanship whose value is enhanced just in proportion to their delicacy and fragility, are so prone, in their very nature, to disease—so wonderfully interwoven together of body with mind, through their intricate nervous organization—that a mental shock or strain can occasion physical disturbance, and physical derangement induce mental aberration or entire intellectual dethronement, and so liable to confirmed invalidism or an untimely taking off, as I have now stated? Does a *man* make this inquiry, he can hardly have lived in the average domestic circle, awake to the anxieties that ever press so heavily. In the old pioneer times here in California, such might have been possible. An enforced celibacy, or the enchantment of half-forgotten memories, heightened by distance in space and the longing for a brighter future, could perhaps have clad each dreamer's ideal with the richly glowing tints painters in Holland so loved to copy from their buxom sweethearts and wives. But the flushed cheeks and the sparkling eyes of those visions of eighteen hundred and forty-eight were but the hectic hollow and the unnatural lustre of New England's consumptive ghosts—the nut-brown maid, but the sallow victim of our central and southern malaria—so many of whose hearts were then breaking from weary bereavement and the idle tales of a flippant, gossiping press, every word of which seemed aimed at some especial darling, far away as he was from all protecting influences, save the mighty one of prayer.

Is it a *woman*, on the other hand, who questions what I have said, of the comparative delicacy which so invests her, by Divine compensation, with a claim upon man's esteem, pity and reverence? Then, exception to her sex, epicene and valueless, alike morally and physically monstrous,

let her descend, devoid of every sense of shame, to those planes of competition with her grosser opposite, for which the unsexed women of the present day so clamor and strive. As broker, politician or professional person, these self-satisfying paradoxes may succeed in gaining their daily bread. But, relinquishing thus that sweeter sphere for which Eve's daughters were created, no longer the partners but the rivals of man, they have lost, to all with a spark of what we still call chivalrous feeling, or a trace of respect for aught above what is purely material and utilitarian, almost as though they were the abandoned creatures of the streets, every claim upon what in their hearts they still so instinctively cherish and long for. This being so, and I know that my words must be felt to be true by all who hear me, I might proceed.

And yet there is a something more that I ought, just at this point, to say. It may come to you with the better grace from a stranger than from one of your own people; and if he has had at all commensurate opportunities for judging, his statement of the fact to which I am now about to refer, may carry more perfect conviction.

In one of the latest issues of your medical periodical press, the assertion appears, that "Dr. ———, of San Francisco, speaks of the much greater prevalence (of certain forms) of non-specific (or non-blameable) local disease in women, in California, than in the Atlantic States, as a fact not only confirmed by his own experience, but by that of every intelligent physician with whom he has conversed upon the subject."

I doubt if the above remark is perfectly borne out by the experience of any number of those physicians who, previous to their settlement in California, had given as much attention to the study and care of sick women, as since their residence here. It will be observed that I am speaking now of "non-specific" disease—that unattended by any imputation of shame. Woman is woman everywhere in the world. She may suffer unduly from goitre in Switzerland; she may wholly escape pelvic cancer in Iceland, as of late seems to have been shown by the learned gynecologist of that country, Dr. Hjaltelin.\* She may have peculiarities due to her race, as those special hypertrophies of the breast and other parts of the body, that to Hottentot eyes are so ravishingly beautiful; or, as in the negress, she may be far more subject to fibroid tumors than the Caucasian, but there seems to be no reason that in California, now comparatively an old, sedate and well-governed community, there should be any redundancy of a class of local affections, that in themselves are common everywhere, and dependent, for the most part, not upon climate, nor diet, nor dress, nor business employment, but upon a neglect, in the single, of proper rest from fatigue, and in the married, of the simplest rules of conjugal courtesy. This is not a mere presumption of my own. It has been borne out by the study of California patients, during quite a number of years.

I shall now present to you, more decidedly, other views regarding yourselves, upon a matter of even greater moment.

A noted, but I think a little too hasty writer, a practitioner of your own State, put into print twelve years ago a statement that struck me at the time as very extraordinary. It was certainly very damaging to the reputation of your people, and, however limited the circle of unprofessional readers that it reached, it must have caused many a cheek to tingle with shame, many an one to flush with indignation, here in your

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\* Journal of the Gynecological Society of Boston, March, 1871.

midst. I have no doubt that the mental anxiety and anguish that it occasioned at a distance were simply incalculable.

"In no place of civilization," it was said in eighteen hundred and fifty-eight, by this gentleman, "do the causes [of ill health among women] exist or prevail to the same extent as in California." These causes, the writer referred to went on to state, were chiefly the "yielding to the seductive allurements of dissipation. This applies," he said, "equally to the unmarried and married; and so general is it," he continued, "that I believe I am correct when I estimate two in every three females, who have reached the age of fifteen, to be victims of this dissipation."\*

The above statements I cannot but believe to have been exaggerated, even so long ago as eighteen hundred and fifty-eight, however unintentional it may have been on the part of their author to convey a false impression. Were they made by any one, of the California ladies of eighteen hundred and seventy-one, he would at once be branded as a disreputable person. The paper, however, from which they are quoted, bears intrinsic evidence of having been very hastily prepared; and in this fact there must be allowed to exist a sufficient measure of excuse, were such thought necessary. The report opened with the following remark, which should be borne in mind when the charges that it made are taken into consideration: "During the past twenty-four hours," such is the admission of its writer, "I have thrown together these facts and reflections in an exceedingly rude shape."

It must not be forgotten, moreover, that physicians, dealing as they have necessarily to do, with so much of vice and wretchedness, may easily lose sight of what is good in the world about them, overborne as it were by their enforced contemplation of its opposite. With conversations that I have had with my friend, upon whose statements I am commenting, since reaching San Francisco, I am satisfied that he made them in good faith, and it is my desire to relieve him, so far as possible, from the grievous false position toward the community and the profession he has by some been thought to occupy.

The immediate effect of the paper seems to have been singularly unfortunate. Not only was the better portion of the public disgusted, but its confidence lessened in that profession, one of whose members had so seemed to malign it. Could ladies consult a physician, if their most innocent ailments were to be made the object of so uncharitable suspicion or comment? Could husbands endure to be supposed always the brutes a vivid imagination would portray them?

Besides all this, it is more than probable that what appeared so great an act of indiscretion had no little to do with the torpor and temporary death that soon fell upon the State Medical Society of California, then in its earliest infancy. Many physicians felt that their experience had been misrepresented, and that the publication under the stamp of the society, for the paper referred to was printed in its Transactions, of what might thus be thought to have been indorsed by them, was a decided and permanent injury to their practice, from which it might take many years to recover. It was certainly a fearful blow at the progress of gynæcology—that beneficent science to whose revelations the world owes an ever-increasing number of women's lives that otherwise were untimely sacrificed. Let us hope that the present year, signalized as it is by the first formal recognition upon your own ground of the

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\* Report on Obstetrics and the Diseases of Women, by R. Beverly Cole, M. D., of San Francisco. Transactions of the Third Session of the Medical Society of California, 1858, p. 133.

members of the American Medical Association by their brethren of the Pacific Coast, and by the establishment of the State Society upon a far firmer basis than it had in that early time, may mark a turning point in the reciprocal relations of the profession and your community; the one pursuing their arduous and so often unpleasant duties with greater zeal and enthusiasm than ever before, the other bestowing a freer confidence and reaping therefor a commensurate reward in better health and prolonged lives.

I have spoken, you will perceive, very plainly upon this topic, basing my right to do so, as I have said, upon personal observation of many Californians, during my score of years in practice. They have been women in every class of society; some of them rich and some of them poor—married and unmarried; some of them returning home to the East for a permanent residence, others temporarily visiting their friends, and still others coming solely for the purpose of seeking advice and treatment. Their diseases have been the same in type—covering, as all these affections do, everywhere in the world, a vast range of differential peculiarities—as those of their sex in other parts of our country. Certainly, they have been no worse; certainly, they have afforded me no ground for suspicion that the people of California, at the present day, lack more than usually the moral sense.

And again, granting that the influence of the old times was not wholly lost, when, in the scarcity of women here, a stray bonnet or slipper is said to have been publicly worshipped, and when the overland journey or the trip around the Horn was attended by peculiar danger to a woman's good name, and that a dozen years ago your State was still a frontier country, and under circumstances in many respects exceptional; it was not, however, so very much more so than many distant or isolated portions of the Union at the present time. I happen to be familiar, from personal study upon the spot, with the diseases of women as they prevail in several parts of the British Provinces and in our extreme Southwest, and am constantly seeing patients from other parts of the country, very many of them sent by physicians with whose own experience, as detailed to me in person or by letter, I am also acquainted. From these data, again, I am forced to the same result. You may have here in California an undue preponderance of deaths in men from aneurism—you may have still, as in your earlier history, more than your share of fatal wounds—but I cannot grant, as regards the morality of your women, unless I count those poor creatures from across the sea, inaptly termed "celestials," that they are one whit the worse, at least so far as one can judge by the character of their diseases, than their Puritan Eastern cousins.

"Female Hygiene." There's a world of thoughtful meaning contained in these simple words. With the discussion of womanly characteristics, physical or mental, we have nothing now to do. Overwritten or understated, we may take them all for granted. In some points inferior to man, in others far above him, woman is in all of them governed by wholly different laws. While his physical life scarcely varies, from the cradle to the grave, save in its steady growth, culmination, and as steady decline, her's is a constant series of changes, from childhood to maidenhood and maturity; and as this period again is shortened to a term of but thrice ten years, the wife becomes aged while her companion may be still in his prime. Whether married or single, her life in its physical aspects is like the tides of the sea, ever ebbing and flowing in obedience to laws that, explain them as we may, are yet among the

darkest mysteries over which the Creator has thrown his veil. The renewal of life, again, by its transmission to offspring, and the physical changes undergone by the mother in supplying her child with its earliest food—these all mark critical epochs in the woman's history, each with its own host of diseases and dangers, all of which may to a certain extent be provided against, and all of which, in their general sanitary relations, deserve attention at your hands.

It were foolish to say that these are topics too abstruse for study, too sacred for discussion. If they were better understood, far more infants would be born living—and I here put aside all cases of criminal interference, which, according to evidence adduced by the President of your State Board of Health, Dr. Gibbons of San Francisco, is probably now as prevalent in California as in the Eastern States; far more children, especially girls, would be reared to maturity; far more women live to old age; far more marriages be happy; far fewer excuses or temptations exist for divorce. What subject, therefore, more practical, or more worthy the attention of a State Board of Health, to whose watchful care not a citizen but that may owe all that he holds most dear?

Very little has as yet been written concerning the subject of Female Hygiene that is at all philosophical or satisfactory; and the crudest notions prevail in the community, alike with regard to the causation of invalidism in women and the best means of its prevention. It has been stated by the author upon whose views concerning the character of your population I have taken the liberty of commenting, that much of the ill health prevailing among the women of one of your cities, San Francisco—over and above what he explained so unpleasantly—is attributable to the effort required in climbing its hills. This, however, even allowing for their former greater steepness, would apply with almost equal force to a residence anywhere in an uneven country—to the dames of Albany, Boston and Quebec, of Valletta, Rome and Edinburgh. Fatigue of the kind referred to may, it is true, aggravate such diseases when already established from other causes, but mountaineer maids are fully as healthy as those of the lowlands; and, so far as regards the influence of participation, within any reasonable bounds, in the enjoyments of social life, there may be as much exposure to chill and over-fatigue in attendance upon the sober lecture or prayer meeting as at the concert or ball—as much mental and physical self-indulgence in the solitude of the cloister cell as in the haunts of gaiety and pleasure.

From the inherent excessive delicacy of woman's organization, there exist a vast amount and as vast a variety of disease peculiar to herself, over and above those ordinary illnesses to which she is liable in common with man, but which themselves are liable to be simulated, masked and increased in virulence by the very influence of her sex. Take consumption, for instance. The sedentary life of women and their comparative seclusion from active out-of-door exercise, even in girlhood, render them more prone than men to a disease so dependent upon a low condition of constitutional vigor. But, in addition to this, it is found that while in men, making allowances for alternations of temperature and atmospheric moisture, and differences in diet, garb and exercise, the lungs perform weekly, monthly and yearly, a certain average of work—in woman the case is very different; there being with her what has been termed an accessory respiratory organ, one of whose duties it is to act at regular intervals as an outlet of the carbonaceous waste, which, during the intervening periods, is in the main disposed of by the lungs; to say, in her the function of the lungs is a constantly varying

element, within bounds which in themselves are liable to variation through disease, while in man it is always one and the same. In her, therefore, allowing for man's greater exposure to wet and chill while attending to his daily labor, the pulmonary system is far more liable to disturbance, derangement and local death.

And so, again, with gastric disease. In man, dyspepsia and the group of morbid affections of which this is but a symptom, are usually the result of some lesion, more or less severe, and more or less persistent, of the stomach itself. In women, upon the contrary, the periodical changes which are regularly taking place within one portion of her visceral economy, are liable, in case of any derangement, to make themselves felt, through the reflex influence of her nervous system, upon the other organs in their neighborhood, just as is so frequently seen, as the distant result of a healthy physiological process, namely, the nausea, and at times excessive vomiting, of gestation, which occurs long before the stomach can have felt any appreciable pressure from the organ primarily affected.

And so, also, with regard to the brain and nervous system. While women, like men, are subject to insanity from organic cerebral disease, and to paralysis following upon apoplexy and similar causes, and to convulsions, as the result of injury or exhaustion from hemorrhage, they present also a host of mental aberrations, that may be of the most general and terrific character, of paralysis the most complete, and spasmodic seizure the most distressing; all of which may be purely functional, from distant and often trivial irritations, whose existence is often unsuspected.

There is scarce a class of diseases, indeed, to which flesh is liable, that I might not in the same manner show to be more common in women than in men; and it will be seen, when their special and peculiar affections, which so often underlie all the others, are also taken into consideration, that Female Hygiene is a much more important subject than might at first have been supposed.

Such being the case, you will permit me briefly to call your attention to the actual frequency and causation of the special affections to which I have alluded. In doing so I shall reproduce certain views that I have elsewhere presented for the thoughtful consideration of medical men:

"There are honest men in our profession who deny the frequency of these special diseases. Having eyes they see not, and even if they saw, they could not understand; this being from no wilful fault of their own, but in consequence of defective training or erroneous methods of observation. There are others, equally honest in their purpose, who are deterred from making the necessary investigation, from a two-fold timidity: fear of the ridicule of their fellows and of being misunderstood by their patients. There are others still, who, from jealousy, natural incompetency, the love of mischief, or ingrained malice, would keep from the laborer his most satisfying recompense, by stigmatizing the records of his cases as false or overdrawn, and as imaginary the diseases they represent.

"It is the honest skeptic, the still incredulous general practitioner, of whom the number is constantly growing less, that I respect. No information on the subject is required by those whose duties lie more particularly among women. The evidence of statistics is not worth much, since pelvic examinations are seldom made during life, or after death, of perfectly healthy women, or those in reality considering themselves

such; but I venture no risk in asserting that the frequency of organic disease—and by this is meant noteworthy and important organic disease—is greatly underrated. Probably two out of every three women in New England, and the same remark applies to other parts of the country, require occasional treatment. Pelvic disease in women covers a range of lesions, vast in number and of very differing character. Identical symptoms may represent diseases intensely divergent. Antagonistic symptoms may represent an identity of disease. Graily Hewitt well has it, that the organs referred to have a life of their own, to a great extent independent of, while they so strongly control the life, mental and physical, of the woman who carries them within her. A hundred cases side by side, and no two of them identical. Such is the experience of every gynaecologist. Since I entered the profession, and this is perhaps what no other man living can say, I have never once prescribed for a married woman with any, the slightest, pelvic symptoms, without a careful personal examination; and while, in a small proportion of cases, there was found so healthful a local condition that it was possible to dismiss the pelvic region from all participation in treatment, in scores upon scores of other cases, where not the slightest suspicion had existed on the part of the patient that there was here any cause for anxiety, there was detected the grave, effective and real exciting cause of the distant or apparently constitutional disorder previously recognized. It is a great mistake to suppose that the presence or character of every form of organic disease can be determined from its symptoms, or that such are always present where the disease exists. I have repeatedly found cancer in its advanced stages, when there had never been lancinating pain, metrorrhagia or foetid discharge. Yet one or all of these are generally supposed necessary to the presence of malignant disease. We may have displacements sufficient to produce sterility, and yet apparently perfect health; the infra-mammary pain, reflex in its causation, mistaken for cardiac or pulmonary disease; the most profound melancholy, supposed of religious origin, sending a patient to an insane asylum perhaps, when it is all owing to a pruritus dependent upon ascarides, but which the patient supposes a device of Satan for ensnaring her soul; [just as I have known a married woman, who had forgotten herself during the temporary absence of her husband for a week or two, commit suicide a few moments afterwards from remorse]. We constantly see pelvic mistaken for intestinal inflammation, uterine fibroids for impacted scybala, and so forth, simply for the reason that the necessary measure of physical examination had not been resorted to, a neglect which, in affections of any other part of the body, would be, by ordinary good physicians, pronounced malpractice.

"In advocating tactile exploration before essaying even medical treatment in cases that are probably pelvic in their character, it will be noticed that I advise it, unreservedly, in the instance of married women. For the unmarried, on the other hand, it should be reserved for cases whose pelvic character is evident, or where ordinary treatment has failed. If no local disease is found, a load of anxiety is lifted from both the physician and patient. If it is discovered to be present, doubt has been removed and the treatment is made decisive. These are matters purely of common sense. Thoughts of sex are the last that enter a pure mind when invalidism is present, and the more sensibly practical the physician, the greater his success and the more sure his reputation.

"It is strange that our younger men complain that the profession is more than full, when there is everywhere, in city and country alike, a

wealth of legitimate and lucrative employment as yet almost unopened, awaiting the zeal of the special worker, the surest key, moreover, to the best general family practice.

"Granting that female diseases are more frequent than has been supposed, for he who seeks cannot but find, many are yet puzzled as to its causation; and these not merely mothers, who do not readily understand how young girls can so often become the subjects of displacements and local inflammations, but physicians, who see in it all, as Dr. Nathan Allen, of Massachusetts, has done, a proof that our women are degenerating into barren shadows of their former selves, physically unable to become the mothers of men \* Such a view I consider mistaken. It might be shown that women are just as fruitful, provided they let themselves be so, as were the dames of a by-gone age.

"A great deal has been written about the causes of what has been termed the physical decline of American women—an expression that conveys a false idea. I acknowledge the frequency, both positive and comparative, of ill health among our women, but believe that a large portion of this is remediable, provided its causation were properly understood.

"Some of the elements of this computation have been fully appreciated: such as the effects of parturition, over lactation, unbridled indulgence, undue mental and moral excitement, exposure to chill at certain critical periods, violent or prolonged muscular efforts, over fatigue, excessive or unequal pressure from the clothing or from apparatus resorted to as remedial, and irritation from disordered function or abuse of other organs, as violent retching during vomiting, excessive constipation, etc.

"The same is true of the disproportionate development of the nervous as compared with the muscular system—the result of an over-stimulating social atmosphere, prematurely entered. Increasing the ill conditions thus begun, come the influence of constrained and faulty positions long continued, whether standing, sitting or recumbent; the use of high-heeled shoes, and of faulty leverage in dress, in addition to the faulty pressure therefrom already pointed out; while beyond this, and by no means least, there lie the reflex and sympathetic disturbances of the nervous system, produced by anterior, posterior and downward pressure upon the pelvic flexures, from displacements or hypertrophies of the pelvic organs, or outgrowths from them.

"Other observers have attributed much of the infirmity observed to the domestic appliances of modern civilization, as the tier upon tier of lofty staircases characteristic of our city palaces; the furnace heat, heavily charged with gaseous poison, which makes of the dwelling a forcing house, devoid generally of the great essentials of such, namely, sunshine and moisture; and the so universal barbarities in diet, only excelled by the haste with which the vile meals are swallowed. A craving for over medication, or too active or constant medical treatment, is no unnatural consequence, and there can be no doubt that many of the means taken to cure disease in reality induce it or give rise to worse; such, for instance, as an indiscriminate and careless resort to sea bathing, mineral springs, electro-galvanism and calisthenics. Inheritance plays, too, its part, and just as the taint of twin births often descends from parent to child, so, no doubt, does a tendency to many forms of local organic disease.

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\* "The Law of Human Increase," *Quarterly Journal of Psychological Medicine*, April, 1868.



"The sewing machine, that compound of blessing and curse to woman, adds to the list of influences causative of disease, not only acting in several of the ways suggested, by the long-continued and constrained position, and fatiguing of the pelvic muscles, but in another, not generally sufficiently appreciated, by which a mental and dangerous disquietude is originated and enhanced by the unintentional auto-stupration.

"There are causes, however, beyond and above these, recognized, a part of them, by a few who have seldom dared to breathe above a whisper what they yet know to exist. Several of them have been referred to by another authority, in an article remarkable for the boldness with which it was presented to the community, and its plain language.\* Every word of the following extracts from the *Knickerbocker Magazine* will be acknowledged to be true. The writer is first speaking of the diseases of women resulting from criminal abortion—an offence to whose study and prevention I have myself given a great deal of attention :

"The health of the mother,' remarks the gentleman, 'suffers materially from the violence done her system and from the shock to her nervous sense. Whether it is effected by powerful drugs or by mechanical and instrumental interference, the result is deleterious to the animal economy. The organs are often seriously lacerated, punctured, irritated or inflamed, producing temporary disease which threatens, and not unfrequently destroys, life, and also, when apparently cured, leaves the organs cicatrized, contracted, maimed, in distorted shapes and unnatural positions, in a state of subacute inflammation or chronic congestion, for all after years a source of pain and weakness and a fruitful origin of neuralgia, disabilities and miseries. Be assured this is no exaggeration, for we cannot recall to mind an individual who has been guilty of this crime (for it must be called a crime under every aspect), who has not suffered for many years afterward in consequence; and when the health is finally restored, the freshness of life is gone, and the vigor of mind and energy of body have forever departed. Languor and listlessness have become a second nature by habit.'

"What is true of the premature arrestment of pregnancy, applies with equal force to the effect of measures for its prevention. Upon this point the authority referred to is equally direct in his remarks:

"An overweening desire for luxury,' he says, 'for dress, fashion, or from simple indolence—sometimes from a desire, which may be laudable, not to produce children to inherit constitutional disease—induces many to take various precautionary measures against conception. We have heard clergymen state "that a man should control the size of his family, as much as a farmer his flock, and that he should not have a larger stock than he can house and feed; that this was in the power of any one; that the lower classes were overrunning with children, and the poorer the parents the more prolific they became." Yes, and the more healthy and vigorous! It is these women who do not pretend to guide the course of events, or make the laws of nature conform to their wishes, who are in health and actually doing the work of the world; while the wise in their own conceit are sufferers, invalids, and useless. The laws of nature and the necessities of our existence, implanted by an overruling Providence, cannot be contravened without detriment to the system. Local congestion, nervous affections and debilities are the direct and indisputable result of the vicious means commonly employed by the community, who are so ignorant on all these matters, and who

\*Knickerbocker Magazine, January, 1860.

are, in fact, substituting for one imaginary difficulty, in prospect, a host of ills that will leave no rest or comfort to be found.\*

"The same unsparing hand points to the frequency and evil consequences of a certain selfish habit in women which is, as I myself have elsewhere shown,\* while itself often the result of some sympathetic neighboring physical excitation, and so not a vice, yet an important element in the causation of other local disease. Unattended by the special source of exhaustion accompanying the habit in the male, it induces nervous irritation rather than prostration, attaining often an intensity of indulgence undreamed of by anxious friends or the attending physician.

"I have not referred to the influence, whether direct or by inheritance, of the various forms of the loathsome specific diseases, for their frequency and their virulence in the female are far less with us than many alarmists would fain represent—less, there is reason to believe, than obtains abroad.

"Beyond and above all that has been said, it must not be forgotten that while, through the influence of the introduction of anæsthesia and the progress of obstetrical science, the pangs and perils of parturition have been lessened, and the chance also of its subsequent evils, as vesicovaginal fistula, crural and other embolism, and pelvic inflammation, and while an increasing self-control in the masses has practically subjected Venus to Minerva, and while the restlessness of the age has endeavored to introduce into public and private life a third sex, that of masculine women, there are causes still effective in inducing ill health in our women which have been only indicated, and never as yet carefully studied. Such are long betrothals, attended as they so often are by hope realized and yet deferred—for the physiology now taught in our schools gives the knowledge of much that were better then dispensed with; the too-prevalent custom of avoiding lactation, lest it interfere with requirements of fashion; and the fact, a very important one in this connection, that, thanks to improvements in sanitary science, the sickly children that in former times used to die in infancy are now many of them raised. The delicate girls that at puberty were mown down by phthisis as grass before the scythe, now many of them live to become wives and mothers, in their turn begetting frail and invalid offspring.

"I do not believe with certain authors that the healthy woman is the physical equal of the man in every respect—but I do believe that, while a host of pelvic aches and ills have grown into existence as the result of a change from the age of Force to that of Reason, there were in the old times behind us, that we are wrongly taught were golden, deaths without number from pelvic causes unsuspected, ovarian dropsies supposed ascitic, local organic hypertrophies, outgrowths and degenerations misnamed affections of the liver, and all sorts of disease, from oversight or neglect by the physician, special in their causation, and wrongly designated as by the providence of God."†

From the above it will have been perceived that the whole subject of Female Hygiene is yet in its infancy; that the causes of ill health may lurk undetected, the very possibility of their existence even not being appreciated; that formerly, as now, there were hosts of bed-ridden patients who might have been restored to society as active laborers for the common good, and of deaths that might have been postponed or

\* Western Journal of Medicine, August, 1867.

† Journal of the Gynecological Society of Boston, July, 1869, p. 39.

prevented; that still there constantly occur the most serious errors of diagnosis, and consequently of treatment, trifling ailments being thought severe maladies, and the gravest affections but imaginary disease; that while some of the old causes of illness have been lessened or removed by the advancement of science, new ones have risen with that of a progressive civilization; and that feeble children, who formerly would have been lost, are now reared. While a certain proportion of these prove hearty and strong, others of them, becoming the feeble mothers of a puny progeny, die early or linger into a wretched old age.

Do you ask me now to what practical result do these facts tend? Ask rather the Judge on the bench, and he will tell you of causes innumerable wherein they have given character to the puzzling suit. Is it a divorce that is sought? "Incompatibility of temper" too often means an enfeebled body, no longer responsive to the claims of passion—a mind perturbed by melancholy or jealous to the bounds of madness—all from some simple physical disturbance that might or might not by care have been prevented. Is it a thief, or a drunkard, or a murderess—though the result of the late trial at San Francisco shows that there is a limit to which such a defence can be permitted to be made—that has come before him for sentence? Ten chances to one there exists a morbid craving for wrong doing, an uncontrollable impulse, in itself a symptom of physical disease, and most likely more marked than at other times, at certain critical physiological periods.

Or ask the clergyman, the comforter to whom so many women unlock the secrets of their hearts. You shall learn of sorrows borne long in silence, and of physical and mental sufferings, to which death would be a pleasure, of whose existence the world does not dream. You shall be told of conflicts that have shaken faith, and of despair that has driven to suicide. They rested, nine in ten of them, upon a physical cause.

Do you put the question to the insurer against death? He will reply, if he understands the true meaning of those tables upon which his success depends, and more distinctly than has lately been done by Mr. Alexander Delmar, of New York, that all the averages, the simplest expectations of life, are fundamentally different in women as compared with men, and that the greater liability in the one sex to decease by accident or intentional homicide, cannot safely balance the evil chances attending parturition, lactation and the climacteric.

And if you ask the undertaker, he will confess that many a fair maid and many a gentle mother has he coffined and borne away to her mingling with dust, of whom he had heard it whispered, "This might not have been."

Come now to the physician for his opinion; and if he be a thoughtful man, who believes that in order to remove the effects of a cause you must reach that cause itself, you will gain from him some useful hints.

Childbirth, he would tell you, should always be attended by the most competent nurse and the most skilful physician that can be obtained. A perfectly natural and physiological process that, in the large proportion of cases, progresses favorably without any aid, it is yet liable, at any and every time, and under any and all circumstances, to the most terrible complications, during which a moment's delay or the slightest ignorance may prove fatal. Hence the necessity of approved attendants.

An anæsthetic, he would say again, goes far in childbed, when properly given, to increase the safety of both mother and child, as does also, afterwards, the process of suckling. Turning the breasts for a few months to their appointed use relieves organs long furnished with an

excessive supply of blood, and lessens many a chance of subsequent ill health and disease.

Infants, you would be told, should be allowed a certain amount of air and exercise. If treated at first more like animals and less like reasoning creatures, the mother's pride might suffer, but it would be more than compensated by a lasting joy in after years.

Girls, little and great, should be far more educated in body than at present, far less in mind. Proud, as every New Englander, of our system of common schools, I yet believe and acknowledge that many a delicate girl has been utterly ruined in body and mind by the mental overwork to which she has been subjected. Ambitious, for that runs in the New England blood; quick of perception, for that's a quality that comes from its clear atmosphere; spurred ever to attempt beyond one's strength, for such is the effect of our unrestful life, which must have the experience, bitter and sweet, of an old-fashioned year in each twenty-four hours; is it a wonder that they early bloom and early fade, so many of them grown women at sixteen, old women at forty, wishing themselves out of the world at the very age life ought to be most comfortable at.

I do not here exaggerate. Study of this matter, as a member of the Boston School Committee in former years, led me to suspect what since then, in practice, I have constantly found to be true. And as for the teachers of these school maidens, a very large proportion of them early find themselves invalids, with over-strained nervous systems and frail bodies, which act and react abnormally, the one upon the other. To stimulate a girl's brain to the utmost, during the access of puberty, is a positive loss to the State. There's likely to be one less healthful parent of a sound and vigorous offspring.

I shall not discuss the question of whether girls should best be educated at home or away; at boarding schools, academies, seminaries, colleges, or whatever the title of their distant place of abode. In some respects the same points would be found to obtain as with that other education which takes these tenderlings from the mother's watchful protection, to the mill, the shop or the service of strangers. The hygienic risks and those to morality are, in number and importance, nearly equal in both cases; they are but too apt to go hand in hand. The terrible instincts, that a chance word or look may awake into activity, never again to be put at rest—which, for the world's good, cause yet its greatest dangers—are there always and everywhere. Happy she who, till the day of her change of name, never becomes conscious of their existence.

From the dawning of that day, however—nay, from the time it is first looked forward to—a host of hygienic questions troop upon the stage. The amount and the character of intimacy that is advisable, or even safe, so far as health is concerned, between young people who are affianced; whether marriages, in a sanitary light, are best made early or later in life; the advantage of pregnancy within the first year or two of wedlock; the care that should be taken of the woman during gestation, parturition and the puerperal state; the fearful risks of miscarriage, to life and to subsequent health, even where complete recovery seems for the time to have taken place; the so-called social evil, and the specious arguments by which the devil would tempt his victims to make its toleration seem a positive safeguard to the virtuous portion of the community; these are all matters with which you have clearly to do, but to which I shall only refer. They are each of them of public importance, for of isolated instances the whole social communism consists. The extension of sanitary knowledge, and the demand its increase creates

for a class of more highly educated physicians, who shall neither pander to the demands of vice, or of that sophistical pseudo-reason which now seeks politically to emasculate our men and to unsex our women, will by degrees set all these knotty questions at rest.

You have close at hand, in the Territory so near—the gynæcological peculiarities of which I have just come to you from studying—the old social problem that so vexed the students of Female Hygiene in David's time. And yet, the openly avowed concubinage of Utah scarcely differs in some respects from that stealthily indulged in by a certain proportion of every civilized people that ever existed since the world began. In the one case there is present a partial freedom from shame, based upon an avowed self dedication to a religious impulse—in the other, fear of exposure; but then, in this, there may be ignorance that another shares the conjugal esteem—while in that, its open fractional subdivision begets, instinctively and inevitably, all manner of heart burnings. Each state has, in its way, its mental frets, its physical ills; each in its way furnishes material for the profoundest study to the medical scientist.

Gymnastics, now-a-days, bring on disease, and are appealed to, to cure it, in women. Dress—as ever since the days it first suggested itself to Eve—still adorns or deforms its wearer, still delights her mind; it may make, or it may cure, one or another form of disease. Enforced position, long continued—as at the piano, the business desk or at the counter—may mar, it but seldom makes, a perfect form. Horseback riding, so beneficial to some, at certain times or for certain indications, may at others, or under other circumstances, inflict irreparable injury. Sea bathing, to some a tonic, is to others the worst of dangers. The voluptuous warm bath may cause, indulged in too frequently or incautiously, as perfect ruin to the health as slavery to opium or alcohol; and these, first taken for the relief of pain, and perhaps by the advice of a physician, may prove—they often do—a flight of steps descending to an early grave, or, far worse, to a prolonged death in life.

But let me stop here, for I fear that I may uncover miseries that perhaps were better hid, at least till the community more fully appreciate the value of what they already but partially know concerning Female Hygiene. Before they can do this men must first value, better than ever yet has been done, woman herself. Not as a voter; her best franchise is through that of her husband. Has she none? Few women on earth, whether young or old, who may not marry, and marry well, if they but live a perfectly beautiful, loveable life.

Not as the rival of man. For partnership she was created—not for identity of work or of purpose. Not as the object of passion alone. The State and its every citizen must value her as one entitled to the tenderest care and sympathy, without whom the world would be a wretched place, but who bears its heaviest burdens; whose hours of pain are tenfold—nay, a thousandfold—those of man; and this, not to mention the agony of childbirth, of whose exquisite poignancy he knows absolutely nothing, and which, were it not wrong to do so, might justly be said to approach more closely than can any other experience of mortals the physical portion of the Passion upon the Cross. Does she seek sympathy, it is her due; or confess to suffering, she is to be believed; or exhibit nervous disturbance, it is far more difficult to bear than mere pain would be; or at times seem capricious, unreasonable, or a severe and cruel despot? A fortunate woman she is, if her temper has never been tried, if her powers of mental endurance have never been overtaxed, if the angel within her has never been slighted or

openly denied. What seems vice in woman, man alone is often to blame for. Where this is not the case, as often it is but disease.

As I said to you at the outset, it's the most delicate things that are the most precious. The very evil chances that so preponderate in the case of the health of the gentler sex should caution you to guard its members from every harm, with a more anxious care, a closer watchfulness—appreciating the fact that every wise or kind act that men can do for the safety of the health of women is done in reality, and in the sense of simplest self-interest, well understood, for themselves.

Such, gentlemen of the California State Board of Health, and such, gentlemen and ladies of the community, is the highest lesson that I can teach you—the fundamental law of Female Hygiene.

# MUNICIPAL REGULATIONS

CONCERNING THE DEAD, THOSE APPARENTLY SO, BURIAL GROUNDS, ETC., ETC.

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TRANSLATED FROM THE GERMAN, BY PROFESSOR L. C. LANE, M. D.

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Those human bodies which at first sight present the appearance of death may be divided into two classes, viz: those in which there is yet hope of resuscitation, and those in which there is none. In regard to the former, attempts for the restoration of life are either indicated, or they are not indicated, according to the conditions under which apparent death has occurred. In regard to the latter, of whom we have no hope, they demand, on the one hand, avoidance of such treatment as would produce death, and on the other, such decided measures as, under the circumstances, are necessary to the interests of the living, without being prejudicial to the dead. Hence, we classify municipal regulations in regard to the dead under four heads:

I. Municipal provisions for restoration to life of such apparently dead as present hope of resuscitation.

II. Municipal regulations against submitting the apparently dead to such treatment as would only be warranted by the certainty of actual death.

III. Measures for the protection of the living against deleterious influences from such apparently dead as may be included in certain lists.

IV. Measures for the protection of the living against deleterious influences from those in whom resuscitation is hopeless.

The latter may be thus divided:

- (a) Measures necessary in case of temporary deposit;
- (b) Measures necessary in case of final deposit;
- (c) Measures necessary during the act of deposit.

## ARTICLE I.

In this category are included those persons who have apparently put an end to their lives, either in some manner unknown, or in such a manner that, according to experience, life is not necessarily extinguished; for instance, by drowning, hanging, etc. In this list we include these bodies, both at the time when they are accidentally discovered, and also after they have been removed from the position in which they chanced to be discovered.

What can be done, and what must be done, for such unfortunates?

This question is to be asked when we are certain, or when we conjecture, that the condition before us is the result of hanging, drowning, poison from carbonic acid or other gases, etc.; of being crushed by masses of falling earth, or of suffocation by some other cause; or of concussion of the brain or spinal marrow; of freezing, etc.

*First*—The authorities must, by the granting of rewards or premiums for resuscitation, as well as also for unsuccessful efforts to restore life, establish a system which shall counteract indifference and the widespread aversion to the dead.

*Second*—A knowledge of means and measures adapted to such efforts should be spread far and wide.

The following particulars may be remarked, in relation to the foregoing general rules:

(a) The rewards may be granted by philanthropic societies. If this is not done, or if it does not answer the purpose, then let the State, or some lesser public body, establish a system of rewards. In some countries, when one jeopardizes his own life in order to rescue an unfortunate fellow being, the reward granted is in the form of an order conferred, or of a sum of gold, no distinction being made between physicians and others, while none but physicians receive a reward for resuscitation or efforts therefor. There seems, however, to be no objection to rewarding others besides physicians for suitable efforts, successful or otherwise, for resuscitation of the drowned, etc. In Prussia, physicians, and only physicians, besides their honorarium, receive, for successful efforts to restore life, ten Prussian dollars from the Government, and five dollars when such efforts are without success. In Paris, the municipal regulations of July, eighteen hundred and fifty, established the following: There shall be allowed, as honorarium, fee or reward, to persons who shall have drawn out of the water, rendered assistance to or removed any drowning or drowned, asphyxiated or injured person, the following rewards: For taking out of the water a person drowned, whether dead or insensible, fifteen francs, etc. These regulations also secured to physicians, besides the established fee, a special indemnification; and to the *Préfet* is reserved the power to confer, in addition, some mark of honor upon such persons, physicians or not, as have distinguished themselves with marked zeal in their efforts to rescue from death. Where such a system of rewards exists, there are abundant claimants therefor. Here and there, closer investigations reveal the fact that, even by physicians, very little was done well adapted to the case, and that, many times, attempts at resuscitation were not at all indicated. That this may be rectified, it is necessary to make regulations that the reward shall only be given when, on the one side, efforts for resuscitation are indicated, and on the other, when those made are suited to the case, and continued until some reliable evidence of death occurs. This will lead, in a most desirable way, to physicians especially interesting themselves more than, we regret to say, is at present the case, in rational measures for the resuscitation of such inanimate bodies.

(b) The knowledge of the remedies in question must, it is evident, first of all exist among practising physicians. This often fails to be the case. The university, as a general thing, troubles itself as little about this matter as the lectures of the Professor of Medicine bring it under consideration. That this is in itself an evil, admits of no question. It is to be overcome by making the subject a special topic in every examination of medical students for obtaining a diploma, and by drawing the particu-



lar attention of those physicians already in practice to their deficiencies in this respect, either by bringing within their reach the cheapest and best books upon the subject in question, or by annually placing in their hands, gratis, a short treatise relating thereto.

As regards indication for the commencement or continuance of efforts for resuscitation, it is well to draw particular attention to these facts, viz: that experience has taught that reanimation has occurred in bodies that have remained several hours under water, and also in cases where death from freezing has been apparent from twelve to fifteen hours; and that others have been perfectly restored who, during four hours of continual efforts at resuscitation, have given no signs of life; hence one should be wary of saying, In this case further effort is of no avail.

In large cities where there is no lack of physicians, the possession of such knowledge by them is sufficient, or nearly so; a physician can always be found, and, as a general thing, in season. But in the country or in small towns, where there is often either only one physician or none at all, and sometimes, also, in larger towns as well as on board ships, the timely arrival of the physician is the exception rather than the rule. In such cases it is desirable for others, who are not physicians, to be capable of rendering all the aid possible. This is a want that has been everywhere experienced and that has been everywhere met, in part, in contributions to the columns of journals and newspapers. But aside from technicalities in such, it has been too common an error to make the instructions too lengthy, to make scientific distinctions, and to lay stress upon the use of some apparatus which it is impossible always to have on hand, and, failing of which, those upon whom help depends become easily disheartened or altogether prevented from making any effort. And yet it is possible to reduce all the instructions which can be given to the community at large to a few simple words, requiring no great effort of memory or judgment, and quite disconnected with the use of any apparatus.

First of all, even with the frozen, all delicacy must be sacrificed. This is to be regretted, but it cannot be helped. Let us not deceive ourselves in regard to the benefit which this information will, as a general thing, be to the unprofessional; there is but little to hope from their aid, but this little we cannot disdain.

Before proceeding to give instruction in regard to what is to be done, it is well, first of all, to say a few words against some customary things, from which one should forbear, even in efforts at resuscitation. What these interdicted measures shall be, must depend upon the harmful customs pertaining to any special district.

It is also a duty to give decided instructions in the manner of rescuing bodies from the position in which they are found, emphatically warning against the use of rough or dangerous means; as, for instance, rakes for bringing bodies out from the water or from filthy ditches, etc. Finally, there are definite directions to be given as to the manner of bringing bodies out from wells, mines or other places filled with dangerous gases, without harm to the rescuer.

All this information is to be given in very few words, and in very short sentences; it is not the place for elegantly turned periods.

We can only give the following general instructions in regard to efforts for resuscitation:

Whoever finds what appears to be a dead body, if it be not already become the hopeless prey to decomposition, however long it may have lain in the water or in any other condition compromising life, should

consider it as only apparently dead, and should carry it to some place in the vicinity of a physician, or to a hospital; or, if a physician is to be found in the immediate neighborhood, let him be summoned to the spot. If the former cannot be done, or if the arrival of the physician is delayed, let the person who has discovered the body himself undertake to arouse it to life, continuing his exertions for many hours. Besides cutting off wet clothing, digging out those who have been accidentally buried, cutting loose the cords, etc., of the hanged, opening the windows and doors of rooms where one has been asphyxiated by gas, either from a stove or gas-burner, and taking other steps, dependent upon the cause of the accident, one must, first of all, place the body in a recumbent position, with the head raised.

If there is reason to believe that the accident was the result of drowning, let the body be laid for a few moments upon the face, the arm being held under the forehead, in order that the mouth and nostrils may empty themselves. In such, and in all cases, the body should be constantly rubbed strongly with the hand, or with a piece of cloth. When one becomes weary with rubbing, or if there be some one else at hand to relieve him and continue it, let water be sprinkled or spurted upon the breast and face of the body; then, alternately, rub and sprinkle cold water; then press the abdomen strongly for a few seconds, towards the stomach, with both hands, and suddenly remove the pressure. Let this pressure and cessation of pressure be repeated from fifteen to twenty times per minute. When there is a second person to assist, let him meanwhile rub the arms. If breathing commences, cease pressure upon the abdomen, but continue the rubbing. If breathing does not commence, then lay the body upon the face for a few seconds, letting the forehead rest upon a piece of wood, cloth, or the like; then turn it upon the side, and continue this about fifteen times per minute, or even longer. In the meanwhile, one can change to the other side, rub to and fro, and sprinkle water.

Frozen bodies must not be brought into a warm room, but must first be vigorously rubbed all over with snow or water, care being taken not to break the limbs. Only when the body has become quite limber again, may it be brought into a moderately warm room, when—and not until then—recourse may be had to pressure of the abdomen, rolling the body and sprinkling.

When the accident is the result of poisoning, let the palate be tickled with a feather until vomiting is induced.\*

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\* **NOTE.**—We do not desire to give to the above limited directions even the most remote claim to being a model for what is demanded. Let every one turn them to his best advantage; it is not easy to make such directions concise, plain, and adapted to every possible case. We have omitted all instructions that would be either impracticable or dangerous, practised by the community at large; such, for instance, as the use of wedges between the jaws; blowing into the nose or mouth, either directly or through a mouth-tube; in the introduction of air by artificial means (even by the professional man), there is often danger of injuring the lung-tissue; injections of tobacco smoke or other agents; mustard plasters; application of leeches; introduction of liquids into the mouth, etc. For the restoration of respiration we find subscribers to Marshall Hall's "Roady Method," notwithstanding Silvester's objections thereto. Some other physicians have followed Silvester in his opposition to Hall. The method of the latter is given in the *Lancet*, of April, 1857: "Let your treatment be in the open air, turning the face and breast towards the current of air, except in very cold weather. To clear the throat, lay the patient gently upon the face, placing the wrist under the forehead; all fluids and the tongue thus falling forwards, the air passages become free. If the patient begins to breathe, wait and watch; if not, or if the breathing ceases again, turn him suddenly upon one side, irritate the nostrils with tobacco-snuff, or the throat with a feather; rub the face till warm and then sprinkle it with cold water. If this be still without effect, do not lose a moment, but induce artificial respiration by again laying the patient on the face, raising the breast and supporting it by some article of clothing rolled together—

How shall we bring these short directions to notice ?

By inserting them in the reading books of our primary and grammar schools; by annual publication of them, in official form, in journals, periodicals, etc.; by posting the same in all public drinking places, depots, passengers' rooms, etc.

It is particularly relevant, for protection against, as well as consequent treatment for, certain accidents, to publish, at the beginning of the season, public warnings and instructions touching such accidents as are especially liable to occur at that season—as, for instance, sunstroke in summer, and the like.

Besides the information to be circulated among the people at large, in regard to the restoration of such as have met with these accidents, there must be added thereto instructions for protection from death or harm of the rescuers, under circumstances dangerous to them. For example: they shall not descend into a well where others have become asphyxiated, without having first driven out the irrespirable gas, by previously letting down a burning torch therein; they shall not enter any dangerous cavity without having a rope made fast to them, which may serve as a signal, etc.

Finally, all such instructions are to be so changed, from time to time, as to keep pace with the progress of discovery and intelligence in these directions.

It is necessary, and especially desirable, that in places peculiarly liable to be the scene of accident, or where the unfortunate sufferers from accident are liable to be brought—as seaports, mines and bathing places—there should always be kept ready at hand, in one place of deposit or more, according to the locality, a supply of remedies and means of succor, which can be resorted to by a physician, or judiciously used by some person or persons who shall have been well instructed in their use and application. These (instruments and medicinal preparations) are to

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or something similar; then turn the body very gradually upon the side and a little beyond, then suddenly upon the face, and continue this changing of position, carefully and without cessation, fifteen times per minute, changing from one side of the patient to the other. (When the patient is lying upon the breast, the thoracic cavity is compressed by the weight of the body, and expiration takes place; when turned upon the side, this pressure is removed and inspiration occurs.) As the body is turned upon the face, press against the posterior portion of the thorax, with an equal, but strong and quick pressure, but not directly before turning again upon the side. (This, firstly, increases expiration, and, secondly, induces inspiration.) The result is respiration and, when not too late, life. To make the blood circulate and to increase warmth, rub the limbs meanwhile upwards, energetically and strongly, with cloths, etc.; by this means the blood is forced through the veins to the heart. When the limbs are thus warmed and dried, cover them. Avoid the continued warm bath and the lying upon the back or approximate position." Silvester's objections to the preceding are of no weight. He himself recommends, besides rubbing, creating warmth, and irritation of the throat, the following in place of the "Ready Method": "Let the ribs and the sternum be raised by means of the muscles which pass from the shoulders to the thoracic walls, while the arms of the patient are stretched upward towards his head. Elevation of the ribs extends the breast, a kind of vacuum is created and currents of air are immediately established. Then press the arms downwards against the sides of the breast for expiration; continue this fifteen times per minute. In order to maintain free passage for the air into the trachea, draw the tongue forwards through the teeth or between the lips, and hold it there; if necessary, hold the lower jaw in position by means of a piece of cloth. The patient lies upon the back, the head and shoulders being elevated; hold ammonia to the nostrils, etc." The Royal Humane Society, in London, gives the preference of this method of Silvester to that of Marshall Hall, the latter, it is said, not having approved itself; the warm bath, in case of drowning, is also recommended in opposition to Hall. In the House of Rescue, Hyde Park, London, the measures directed in regard to the drowned are, first, to empty throat and nostrils, then to proceed according to Silvester's method. Immerse the body to the throat in a warm bath; after twenty seconds lift it out of the water and throw cold water upon the breast; hold ammonia to the nostrils; again proceed according to Silvester's method; if still unsuccessful resort to the apparatus for inflation. Take the body out of the bath and rub it with dry, hot cloths, still patiently continuing the above method.

be kept together in a chest (*boîte à secours*). The contents of these chests will vary according to circumstances; but, whatever they may be, one thing must not fail to be borne in mind—that time renders them unfit for use. For instance: the leather valves of bellows for introducing air, or the tubes to pumps and syringes, no longer close tightly. According to our present views, as they are to be used in mines, near the water, in hospitals or in houses of rescue, the following would suffice for the contents of such chests: Some woollen wrappers or blankets, shears or scissors, corks (for holding the mouth open); a large alcohol lamp, ready filled, with tripod; a few brushes and pieces of flannel; syringes, materials for cauterization and moxa; some long goose or hen feathers; some spirits of wine, oil of mustard, solution of ammonia; some emetics, ether, instruments for blood letting and for cupping; tinder or matches; a few yards of old, soft linen; some wadding; any simple instrument for blowing air from the mouth into the mouth or nostrils; a hollow sound, for introducing air into the trachea (when made of india-rubber, to be used only so long as it is soft, as otherwise it may easily break or crumble in the windpipe), and instruments for performing tracheotomy. Electrical apparatus can be dispensed with, as well as the apparatus for injecting tobacco or other smoke, which the French place in their *boîte à secours*; while it might be advisable to have, in the houses or stations of rescue, Harvey's apparatus for warming, which is thought by many to be quite practical.

In mines, besides the *boîte à secours*, there should also be an apparatus for respiration, in order to enable one to penetrate to the scene of disaster, even through dangerous gases. This apparatus can be so constructed as to supply the air demanded, either by means of an air box filled with compressed air and carried upon the back, or by means of a tube communicating with the open air. In either case, a valved mechanism prevents the mingling of the expired air with that to be inspired. These apparatuses are generally used only in mines where, in consequence of explosions or fires, persons are to be removed out of irrespirable gases, but could, of course, be used in wells, vats, burning houses, etc. A similar one might be adapted to the use of divers, in attempting to bring up bodies from the bottom of the water.

#### ARTICLE II.

Where extinction of life is yet doubtful, we are to act upon the assumption that life is present, and to accept the possibility of changing this doubtful condition into a state of complete animation. People are apt, as a general rule, to look at the matter in exactly the opposite light, and to act accordingly, and hence the unfortunate victims are liable to suffer from a want of the thorough energy necessary to their perfect resuscitation. This kind of killing should be legally and energetically counteracted. The danger threatened arises—

(a) From inconsiderate covering of the respiratory orifices of the apparently dead, by the laying on of clothes and bandages, heavy coverings, etc.;

(b) From the placing of weighty objects upon the abdomen;

(c) From stretching the bodies;

(d) From chilling the body by bringing it into too cold a place;

(e) From inclosing it in the coffin;

(f) From too early burial or deposit in some close apartment used for the reception of the dead;

(g) From too early sinking in the sea (from on board ship), or from premature cremation of the body, where that custom is practised.

The custom, here and there prevalent, of drawing away the pillow, may also have an injurious effect. The first five dangers mentioned (a-e) vary, in degree of practice, in different localities. In one place we find one foolish custom; elsewhere, another; while many others are omitted in the above enumeration. The closing of mouth and nostrils is to prevent the escape of froth; the laying of weighty objects upon the abdomen, to prevent the puffing up of the same, etc. This mistreatment should be opposed by simultaneous instruction and authority, under penalty of a punishment not too slight. To accomplish this it is necessary to investigate and ascertain what methods of mistreatment prevail in certain localities, and adapt thereto instruction and authority used.

There is not the slightest doubt underlying the statement that bodies may present to the eye of the unprofessional man, and even to the physician unfamiliar with certain conditions, the appearance of death, and nevertheless still be alive. That there is not the slightest doubt that this condition of apparent death may continue several, certainly more than three days, without passing into actual death, is equally well established by the fact that more than one case is known where a mere accident has prevented the burial, deposit among the dead, dissection, final inclosure in the coffin, or burial in the sea, of the living, and this is relative authority for accepting the probability that in other cases *burial of the living has taken place, and that it may take place again.*

What means does municipal or State authority possess for protection from such mistakes?

Reason replies, none but the ascertaining of the presence of actual death before the final closing of the coffin, or before the inhumation or section of the body. Grant, as we must, the truth of the preceding statements, and there is absolutely no other means. It may, indeed, be admitted that apparent death is a very rare event—that, touching this subject, much has been invented and exaggerated—but we must also admit that it has been examined but superficially and with prejudice; and yet one single instance among millions would here be enough for us. There is known, however, more than one incontrovertible case of long apparent death which has been mistaken for reality, and more than one wholly incontrovertible case of the depositing of persons, dead only in appearance, within the walls of the tomb.

Hence we may say that the laws of some countries which have made obligatory an inquest in order to determine death before burial, are no concession to an undue timidity, and that the non-existence of such laws does not admit of vindication.

How shall this obligatory inquest be satisfactorily established?

It has, in fact, been introduced under different forms in different localities; (a) in some places it has been simply ordered to be the duty of the municipal officer, i. e., an unprofessional administrative officer, before granting a permit for burial, to ascertain that actual death has occurred; (b) in other places unprofessional men have been qualified to make a suitable inquest and their intercession made obligatory; (c) and, finally, in yet other places, professional inquests have been made an indispensable condition. Of course these regulations never exclude the scientific inquest of the faculty.

(a) This method needs no discussion; it is in no manner provided that the acting official shall have knowledge of the art of testing the various signs of death, or shall, in fact, examine the body; therefore such a

regulation is of no value. (b) This method is valuable; it is everywhere available, is not particularly expensive, and is easily controlled. (c) This method is very expensive in the open country where there is no physician, or in thinly populated districts; hence there is great objection to it in such localities, since the expense cannot, with propriety, be assumed by the State, and the burden must fall on the relatives, or on a small community.

For this reason the obligatory inquest is to be required to devolve upon regular physicians only in those places where they reside; elsewhere the inquest is to be committed to some properly qualified person, outside of the profession, who has passed an examination and been sworn into office. In both cases there should be a fixed fee for the certificate.

If it be decided to establish the method (b) the first step is to procure a suitable person for inspector; such may always be found among subordinate employes in the profession, for example, hospital nurses, as well as among other classes; midwives are not eligible on account of the danger of carrying cadaveric poison to their patients. The person selected shall first receive proper instruction in regard to the manner of proceeding in the examination of bodies, in order to determine life or death, and he shall be obliged to assist in such examinations; he shall then pass an examination, both theoretical and practical, shall have the oath of office administered to him, being instructed what fee it shall be legal for him to collect, as well as what penalty he will incur through a careless or inconsiderate certificate. These persons must be of irreproachable character; they must also be subject to immediate removal by the authorities, in any case of the careless performance or the neglect of duty. The community is to be made aware that, where more than one inspection is made, the costs are to be proportionally increased; for this reason the inspector shall be summoned only when the body presents certain signs of decomposition, viz: green spots upon the abdomen, sinking of the eyes, and the indubitable cadaveric smell.

The certificate shall be dependent upon the inquest; it must contain Christian name and surname, place of death, age of deceased, date of examination by inquest, temperature and color of certain parts of the body, existence of cadaveric odor (wounds, marks of violence or peculiar signs to be noticed for the benefit of the police), and the conclusion, stating that the facts mentioned warrant the inference of death; place and date of attestation. This certificate is given to proper authorities, who issue to the sexton or undertaker a permit for burial.

The examination of the Inspector or Coroner falls to the Board of Health; in the Government, State, or municipal authorities is vested the power of approval or revokal.

Societies or Government shall provide for payment in case of poverty.

The attending physician or physicians shall also affix their names to the certificate of death.

The legal fee of the Coroner is to be officially announced

At sea the obligatory inquest is to be made by the commander of the ship, or by some officer, who must fill out the prescribed formula, which is to be forwarded to the magistrates of the native place of the deceased.

### ARTICLE III.

The emanations from the apparently dead, included in certain categories,

may be of a noxious character. On the one hand, under certain circumstances, both the really and the apparently dead are a source of great inconvenience and discomfort to others. The former is the case when death is caused by cholera, typhus, etc., or when offensively smelling wounds exist; the latter, more especially in institutions for the sick, hotels and public houses, both large and small, bathing resorts, etc. In the former case sanitary interests, in the latter pecuniary or other interests, demand the speediest possible removal of the bodies. These are, *par excellence*, the cases when such bodies are in danger, either from being buried while alive, from suffering from the too great degree of cold of some apartment or place of deposit where they are temporarily placed, from the too early closure of the coffin, or from other mistreatment. The different interests of two different parties are here to be kept in view. There is but one way of meeting the requirements of such cases, viz: to prepare a third place where the bodies can be kept until death is certain, without danger to themselves or to others, and without interrupting the business of places of public resort, and the like. Such a place may be transient, for the temporary emergency, or permanently established. The latter should, by all means, be the case when there is liable to occur almost daily occasion for its use, viz: in hospitals of every kind, and in large cities, where, in hotels, there are frequent instances of death among the travelling public, and where contagious diseases, of mild or severe character, are continually more or less present. For such cities it is also proper to have some place of deposit for such apparently or actually dead bodies as may be accidentally discovered in such state, and which, being unknown, may be here deposited, where, under proper guard, the public may have entrance, or may view through a window, thus enabling relatives or friends to see and recognize them.

Although in small villages and towns there is seldom and rare occasion for such a building, yet there is no such place where the necessity may not arise of removing from the vicinity of others such apparently dead as have been the victims of contagious disease, or where there may not, any day, arise an instance of inconvenience and trouble from the presence of a dead body, where no contagious disease has existed, hence making, even in these places, such a place of deposit desirable; although, on the other hand, being less subject to contagious diseases, and, even in their public houses, experiencing less inconvenience from such causes, the expense of the maintenance and erection of such a building should be allowed to have great weight; more especially, since the idea generally prevails that some costly structure is required, whereas, on the contrary, any cheap, simple building, containing one or more rooms, with conveniences for warming, is sufficient for the purpose; hence, the erection of such a place of deposit in these places should not be obligatory.

It is not objectionable, neither should it be considered necessary, to employ any special apparatus for conveying information of the revival of the body to the watchers thereof—for instance, bells or wires attached to the fingers of inanimate bodies. It is, however, necessary (a) for the space devoted to these bodies to be divided into several compartments—preferably, a separate apartment for each; (b) that these compartments be light, and warm in winter; (c) that they be secure from the depredations of cats, rats, etc.

Inquest and certificate of death shall be as obligatory for final closure of the coffin and burial from such places of deposit as from elsewhere.

During the present century, much has been done in all countries in

the direction of the foregoing regulations, but more particularly in Germany.

#### ARTICLE IV.

Human bodies, presenting unmistakable signs of death, may be the source of considerable danger or inconvenience to their more or less immediate neighborhood. They are either—

- (a) Temporarily deposited in tomb or elsewhere;
- (b) Finally deposited; or,
- (c) In the process of being deposited.

(a) In this case they may become harmful as channels of communication for dangerous contagious diseases, or as mere masses of putrefaction; the danger may arise either from their open exposure in private houses, churches, etc., from transportation, or from too long delay of final burial.

The transportation of dead bodies is a feature of more modern times.

Until the non-contagious nature of bodies that have died from cholera, typhus, yellow fever, etc., has been proved, rigorous legislation can prevent the public exposure, transportation or unnecessary delay in final burial of such. In order to secure the necessary control in regard to transportation, this must receive the authorization of official attestation that the person did not die from cholera, etc. In the transportation of bodies where death has resulted from any contagious disease, we may not rely on the security granted by air-tight or by double coffins; it is an easy matter to agree in regard to transportation which threatens to be a source of danger.

As for those bodies not infected with contagion, their principal deleterious influence, before final burial, proceeds from the process of decomposition; the impregnation of the atmosphere with the products of this process renders it necessary that final deposit be not too long delayed. Their transportation may be allowed when neither gas nor fluid can be perceived to escape from the inclosing coffin, hence warranting the inference that nothing can escape therefrom. Such hermetical sealing can hardly be obtained with wooden coffins, but easily, for a time, with soldered metal or cemented stone coffins. Before granting a permit for transportation, the tightness of the coffin should always be tested.

We have said that the too tardy interment of bodies not infected with contagion, is to be avoided on account of the changes produced in the air by their agency. These changes are considered detrimental to health. *Are they so?*

We can easily prove that, by the agency of moist, putrefying animal substance, a great quantity of oxygen can be withdrawn from the air and be replaced by carbonic acid and ammonia; this requires only very simple experimentation.

From the discoloration of coppery alloy within tombs, we may conclude that the air therein contains sulphurated hydrogen; but, besides these volatile substances, there are doubtless many others which pass from dead bodies into the atmosphere, as yet unascertained by us. The consumption of oxygen through the agency of dead bodies has no hygienic significance except in special instances; it is the admixture of foreign substances which here comes into consideration as of toxicological moment.

These foreign substances are not merely exclusive products of chemical processes in dead bodies, covered by the general terms of putrefa-



or decomposition ; but there are also bio-chemical beings who have taken up their abode in these bodies. Aside from these living organisms and the changes of air which they introduce, also, doubtless, in mere oxydation, not only carbon, ammonia and water are produced, but, in addition, a series of intermediate products which are the essentially poisonous ones. Cloëz has discovered that contact with the air develops, in simple fatty tissues, not only carbonic acid but also acetic and acrylic acids, as well as other products. The living organisms in the dead body have been previously introduced into the intestines through the medium of food and drink, into the lungs through the air inspired, into the conjunctiva of the eye, and perhaps even into the blood itself ; and these living organisms, like the oxygen of the air, create general chemical changes, and, in particular, those which produce cadaveric gases. On those parts of the body where the warmth and dryness of the air quickly produces desiccation, these living organisms do not find so favorable an abode as in the intestines, under the arms, and like localities, where, consequently, the cadaveric phenomena may be earlier and more intense in character than upon the skin and conjunctiva. It is probable that the cadaveric gases in unwounded bodies first arise from the intestines ; hence they find outlet not only through the mouth and anal opening, but, when the body is in a horizontal position, also through the abdominal walls, which are no longer air-tight, perhaps because, from warmth or from chemical action, they are specifically lighter than the air and rise vertically, hence giving way where they find the least resistance.

While we know this to be always the case, we do not yet know those volatile substances which escape from a non-gangrenous cadaver. It is certainly not the carbonic acid, hydrogen, or the chloride of ammonia, which are of special hygienic moment ; it may be the phosphorus and sulphur united, or it may be minute living bodies suspended in the gases.

Observation of the physiological effects of these volatile bodies shows that, greatly diluted with air, they are not necessarily harmful ; but, inspired with a small quantity of air, may produce sickness. Of unburied dead bodies intact, we have no conclusive experience satisfactory to all inquiries in regard to the latter statement, but of parts of dead bodies we have such completely satisfactory ; for instance, a Mr. Ollivier, having at a certain time visited the shop of a dealer in bones, was attacked by diarrhoea and vomiting, and other symptoms, lasting for several days, the results merely of ingestion of so-called decomposed substances, and not to be referred to want of oxygen, or to carbonic acid, or chloride of ammonia in the shop. All animals, except those of prey, fly from the stench-emitting dead body, and this is, indeed, an unmistakable sign of the hygienic import of cadaveric gases.

Undoubtedly, to a certain degree, these volatile bodies differ quantitatively and qualitatively, in different cases ; often, too, they appear earlier or later, in greater or less bulk ; warm, moist air is always more favorable to their development than dry, cold air ; many medicinal agents must also have an influence ; in some places and at some times the *penicillium glaucum* and other fungi and vibriones, which create the first development of gas in the intestines of the cadaver, are less numerous than in other places and at other times, etc. But that the living, microscopic beings (fungi, vibriones, etc.,) play a great part in the changes which occur in the dead body, is conclusively proved by the researches of recent investigators, in which organic substances, very changeable by nature, afforded none of the so-called products of decomposition when in contact with air which contained no living organisms.

We may conclude from the preceding that the gases from unburied dead bodies are injurious, and that the public, so far as possible, should be protected from their vicinity; this is also desirable from the reason that there are cases where we do not know whether or not the dead body may be infected with contagion.

To obviate the deleterious influence arising from advancing decomposition, it is necessary to fix a limit to control final deposit. The fixing of such a limit has been particularly necessary in England, where the dead are retained in dwellings sometimes as long as three weeks, principally from fear of premature interment. In order that the houses may not be filled with offensive odor from the dead, lying in their coffins and withheld from burial, it is the custom in England to conduct the gases off through a box filled with charcoal or some other deodorizing powder; this, at best, can only then prevent the offensive odor when the gases find absolutely no other outlet from the coffin. That the deodorization and filtration of gas through the powder is of no physiological significance, is not, from present knowledge, to be determined. For the absorption and deodorization of the gases, the use of double coffins, having the intermediate space filled with charcoal, has also been resorted to. The maximum limit in question is not to be confounded with the minimum limit; the latter should protect—which it cannot—from interment of the living; the former, from deleterious influences from the dead. The minimum limit cannot be fixed in days; the maximum, exactly, only when actual death has been ascertained to be present; we can then say, death being undoubted, final interment shall follow, at the furthest, within a definite number of hours mentioned, after the certain ascertaining of its presence. Legal regulations usually relate to the minimum limit, since, in general, people incline to too early rather than to too tardy interment.

(b) The interment of the dead may be under circumstances not interfering with conditions of health, or under such as may effect these conditions. The first category includes burial out at deep sea, and, if we may venture to include this under the name *interment*, the cremation of the dead (when under proper management, without filling the air with unpleasant odor), embalming, and preservation in spirits of wine within air-tight vessels. The first method needs no comment. Cremation was practised by some of the nations of antiquity, is still here and there customary, and in modern times has found advocates in Holland, England and France. This method very certainly protects from *burial* alive, but, if proper laws in regard to inquest of the body be wanting, assuredly not from *burning* alive. The substitution of cremation for burial is of sanitary value only in so far as this: that in the latter case the dead body remains a decomposing mass; in the former, not. Cremation demands complicated and precautionary arrangements for the avoidance of offensive odor; burning upon piles of wood is, mostly, but a roasting of the dead. Besides its hygienic advantages, cremation has an economical advantage in regard to burial space. For some it may also have a special moral import—to be able to always retain near them the ashes of the departed. When cremation is so conducted as to produce no disagreeable stench, or to allow no ill effects from the unavoidable odor, it is certainly preferable to burial. It is impossible, however, to substitute it in place of the latter by legislation, because the custom of interment has so rooted itself in all civilized nations that the setting aside of it would arouse unconquerable opposition; and besides, moreover, that interment admits of such regulations as to render it completely without n

power. Hence, legislation has nothing to do against properly conducted cremation, but rather to favor its adoption; require it, it cannot.

Embalming of the dead was more in vogue among some of the ancients than among moderns. It was not, however, practised among all classes, but confined principally to royal personages and people of rank. There are various processes of embalming, with various results. The cavities or blood-vessels of the body may be filled with agents to prevent decomposition, and to destroy microscopic organisms. On account of its rare practice, it seems unnecessary to speak here of the embalming or preservation of parts of the body (heart, etc.) for other purposes than for museums or scientific societies.

The different methods of final disposal of the dead are of great hygienic importance. They are: committing them to streams of running water, interment and entombment.

The first method is confined to the Ganges and its branches. In this mode of final disposal, dictated by religious motives, the bodies are often carried by the water into small tributary streams, or upon the shore, where, in the sunshine and under the influence of vegetations, they become powerful sources of atmospheric poison, aside from the noxious influence of the water. It is said of the dying, that they often cause themselves to be carried to the shore of the sacred river, that, after their last breath, they may immediately fall or be pushed into the stream. It devolves upon us, more nearly, to consider interment and entombment alone.

Various modes of inhumation have prevailed among various nations, as well as in the same nation—in the open air, and also in inhabited or frequented houses, as in the dwellings of the Egyptians and the churches of modern times, both without and with inclosing vessels, these latter being of stone, wood or metal. These vessels have a similar—or almost universally the same—form among European and other kindred nations. In eastern Asia, earthen vessels made of clay are used. More modern metallic coffins are made with plate glass for the top, or over the face, and furnished with tubes or conduits; they may also be sealed air-tight. One grave receives either only one body, or, at the same time or subsequently, more than one. In the latter case it either remains quite open until full, or the occupied portion is separated from the rest by a board partition, and this board is covered with earth. Further, a grave is either allotted forever to the first body deposited therein, or it may be opened again after a time and used for others. The burial place continues to be used for centuries for this purpose, or it becomes abandoned and, at some future time, converted to other uses. Occasionally we find that sawdust, clay, shavings, charcoal and tan have been used for the absorption of fluid matters. The body in the grave, encoffined or not, has also sometimes been sprinkled with hydrate or chloride of lime, though perhaps this process has been oftener advocated than practised.

In entombment the body is deposited, inclosed in some vessel or otherwise, in a natural or artificial cavity, in which it is immediately surrounded, neither by earth nor stone, but by a stratum of air. Such cavities we will call tombs, in distinction from graves. Entombment is the frequent custom among highly civilized nations of our time, as it has also been comparatively frequent in earlier centuries. These bodies are deposited in grottoes, caverns or walled tombs, the latter being in the open air or within inhabited or frequented buildings, as, for instance, the walled mortuaries of the Catholic Order of Franciscan Monks; such are often accessible only through the chapel. While in other tombs the

bodies, inclosed in coffins, are placed near together, or upon each other, we find some mortuaries of the Franciscan monks divided into compartments by walls of masonry, and these compartments have narrow, sliding, horizontal partitions, each one of which is appropriated to a dead body, which being placed thereon, the opening is closed with stone and mortar, and the sliding partition becomes fixed. This mode of deposit of the body, when permitted, is only in exceptional instances; general burial or entombment in churches is now almost universally prohibited, and finds frequent exceptions only in isolated districts. Finally, the tomb is either closed forever upon the reception of one body, or it receives at different times new occupants, or it remains open to visitors.

The above differences in methods of disposal of the dead are of moment to those who control legal regulations in regard thereto.

In order first of all to ascertain, so far as we can decide from our present insufficient knowledge of the chemical changes of the dead body, at what point of distance sanitary considerations will in general permit burial or entombment to take place, we must first of all reflect that we can rely upon the hermetical closure of no kind of coffin for the space of ten years; *metallic* coffins, as well as the substance with which they are sealed, may become corroded from the volatile and fluid cadaveric matters, and thenceforth no longer be securely tight; *wooden* coffins, when quite dry, crack, remain less tight where joined, from the nails or glue becoming loose, and finally, they rot very soon in some localities, and everywhere after a little time; in *stone* coffins, the efficiency of the cement cannot be guaranteed as lasting—moreover, many kinds of stone are more or less permeable to gases and fluids; in *glass* coffins, the cement still offers an objection, since without it there can be no secure closure of such. It is self apparent that all very heavy coffins are liable to being cracked or broken in removal, and that thereafter their tightness would be unreliable. Hence we see that the insulation of the contents of the coffin from the air directly surrounding the coffin is by no means to be considered the rule, but only the exception. As a rule, the air within the tomb must contain volatile cadaveric substances, as may easily be demonstrated; even with metallic coffins, tombs are hardly ever free from the specific cadaveric smell. Even when they remain closed we seldom find complete isolation from the open air in walled tombs closed by masonry, metal plates, stone slabs, or wooden or metallic doors; for, on the one hand, the porosity of most kinds of masonry, such as bricks and mortar, admits of a circulation of air; on the other hand, this occurs through crevices in some places, through the imperfect closure of the entrance, or through chinks in the masonry or locks. Hence, on a permanent confinement of volatile cadaveric matters in the depositing of the dead in tombs, we can rely only occasionally. When thus these matters in question penetrate upwards and outwards from the tomb, into inhabited or frequented spaces, they may become a dangerous source of infection, as has been noticed in case of tombs within or beneath churches; and for this cause alone, as far back as the earliest centuries of the Christian era, the bishops themselves opposed the final depositing of the dead in churches. When, however, as in grottoes or underground caverns, with two openings, the emanations in the cavity are continually carried away by a ventilating current, the most delicate sense of smell cannot detect them.

In burial in graves the conditions are different in essential particulars. Since here, also, the use of the coffin is optional, and as a gene

the wooden coffin makes no claim to complete tightness, and is much more liable to permit the escape not merely of volatile but also of liquid matters, hence the coffin, as a protective agent, has absolutely but little or no influence. The same may be said in regard to the limited quantities of lime sometimes used.

Disregarding the chemical nature of the earth, let us now consider dead bodies deposited either in *fine-grained*, loose soil, or in soil composed of *gravel* mixed with fragments of stone of various kinds. The depth and dryness of the graves being in all cases alike, the interchange of volatile matters between atmosphere and grave varies, according, first of all, to the size of the interstices or pores which, in different soils, separate their component parts. Gravel and soils of a similar nature, on account of the large pores as well as the lesser power of absorption of water, allow rain, snow water, as well as also comparatively lesser quantities of water, to penetrate into the grave and thus more frequently render the bodies moist; on the other hand, the same cause facilitates the introduction of air freed from moisture, which has a drying influence upon the dead body, while by means of its entrance is also afforded to fungi and animalcula, which cannot dispense with the atmospheric air, and which have, perhaps, been brought into the grave with the dead body, and whose existence and increase upon the dead body is thus favored. The chemical changes in the dead thus become quantitatively strengthened and qualitatively influenced. Hence, in coarse earth of this kind, the decomposition of the body may be very rapid. Such soil, however, is not the common condition. As a rule, soil is more or less fine-grained in character; when extremely so, it consists of fine dust, or is more or less composed of clay. Of the soils of coarser grain we find coarse sand or loam, intermixed with larger or smaller pieces of limestone, feldspar, mica, etc. So long as these various soils are not impermeable to water between their particles, they do not prevent the interchange of gaseous material between the grave and the atmosphere; hence, the coarser and drier the soil, so much the more active this interchange. It is self-evident that the thicker the layer of earth between the dead body and atmosphere—that is, the deeper the grave—other conditions being the same, so much the smaller will be the amount of decomposed material set free in the atmosphere in a given length of time. For instance, let there be but a single thin layer of earth over the body, and the circulation of gases is almost as rapid as if it were wholly uncovered; but let the layer be six feet thick and the gaseous circulation will be essentially slower. If the ground is covered with thick ice the communication between the dead body and the atmosphere is shut off; when the ice cracks it is restored. If the close-grained earth is dry when the body is imbedded in it, and possesses the power of receiving a large quantity of water before allowing it to filter through, it may in such a case occur that even during a long, heavy rain no water will trickle through upon the body, or that even the direct inclosing layer does not become moist. Thus the influence of the air upon the dead body is greatly restricted, and the atmospheric water is shut off from it; the decomposition of the body occurs but slowly, and the volume of volatile matters which escape into the atmosphere is small. The mechanical relations of a soil of such a nature is also unfavorable to the life of animalcula or vegetations within the grave. Riecke has, however, directed attention to the fact of the occurrence in summer of fissures in a clayey soil, and that these fissures, becoming deep, essentially increase the interchange of material between atmosphere and grave.

If the body becomes covered with water within the grave, there is only indirect communication with the air. Where the water penetrates, only fungi and vibriones of a certain kind can live; so far as change in the body depends on oxygen, it can occur but slowly; hence, in such a case, decomposition is generally retarded. The water itself absorbs matter from the body; let the water sink below the level of the body, and immediately, as soon as the air again gains entrance, changes in the moistened body make rapid progress.

The *chemical differences* of soil appear to have undoubted influence upon the progress of change in the dead body within the grave, in certain cases—for instance, where water penetrates through the earth to the body; soil containing common salt, saltpetre or iron, giving passage to water impregnated with these substances, certainly has an influence upon the changes in the body; on the other hand, the cadaveric matters are absorbed by some soils in much greater quantities than by others. But at the present time, neither from theory nor from experiment can it be said how the change occurs in soil rich in clay, carbonate of lime, magnesia, oligistic iron, common salt or saltpetre, nor what relations these different kinds of soil, when alike in the size of their component particles, hold to the volatile cadaveric substances. But we may not venture to assume that there is any kind of soil which will remain wholly unchanged chemically by the dead body, or that there is any compact clay or other soil which will retain those matters which have an influence upon health.

Again, *temperature* has an essential influence upon the progress of the cadaveric changes in the grave. In very cold winter weather, shallow graves can be the home of no great chemical changes; these make their appearance in spring. The higher the degree of temperature in winter within the grave of usual depth, so much the more activity in the process of cadaveric change at that season; continued low temperature, in deep vaults, may delay the process of decomposition. Decomposition takes place more slowly within shaded graves than within those exposed to the sunshine; the better conductor of heat the soil is, so much the more is decomposition favored; under the influence of the high temperature of very dry air the dead body withers and dries; here apparently pure oxidation prevails through the action of atmospheric oxygen, which, perhaps, ceases when the process is completed. (Mummification by means of artificial drying, also in burial in the sands of Sahara.) Warmth and moisture combined quickly effect decomposition.

The *individuality* of the dead body also influences the process in question. Children, women and fat bodies decompose soonest. Riecke ascribes some influence to *nationality* also, stating that four days after an encounter between the Romans and Persians, the features of the faces of the former were scarcely to be recognized, while, on the contrary, those of the latter were become completely dried; but this may have been rather an indication of different *manner of living*. Moser states, as the result of exhumations, that death by cholera is followed by more rapid decomposition in the grave than that from other causes. Certain *occupations* are said to have a tendency to retard post-mortem decomposition.

The nature and degree of these changes are certainly influenced by medicinal impregnations, as well as by those of other foreign matters.

The part of the body which longest resists decomposition is the brain,

particularly the cerebellum. Moser, in his exhumations, found cerebrum and cerebellum both partially present after twelve years' burial; but here, too, we find variations, the cranium having been found empty one year after the burial of the body.

In many (perhaps in all) buried bodies growths of mold are more or less revealed; they are found of a grey, white and reddish color; to what species these fungi belong is unknown.

The eggs of those flies which frequent dead bodies can be developed to complete insects only in bodies remaining above ground, or perhaps in a cave, not in those deeply buried; while the maggot can creep forth out of the latter, and, if many eggs have been deposited upon the dead body, they may be found upon it in innumerable quantities.

The cadaveric changes which give out the bulk of volatile matters have, under general conditions, their limit. After several years, varying according to special circumstances, little or no gas is perceptible to the sense of smell. Of course, the gases may yet have physiological significance. The soft parts are then either mummified, or wholly or partially converted into the so-called adipocere, or are represented by a few little heaps of earth, or by dark leathery masses which remain upon the bones, the nature of the composition of both being unknown. The wooden coffins are decayed, the bones fallen apart, having a white, brownish or brown color. Since different cadavers in the same kind of soil require different periods of time for the process of mummification, saponification or decomposition, therefore, even if we accept absence of odor as a sign of innoxiousness, judging from experience in inhumation, it can hardly be stated with certainty in what time *all* cadavers in a burial place may be considered free from noxious emanations. Still more dangerous would it be to say that, in any definite number of years, the bodies in one certain kind of soil, interred in graves of this or that depth, will cease to be sources of noxious emanations. If the residuum of complete decomposition rises from the dry grave into a higher stratum of earth, and thus is brought in contact with rain, it may again give out some odor.

According to these general statements, we can form some judgment of the difference between the numerous volatile cadaveric matters which, under various conditions, are communicated to the air from out graves and tombs. In tombs these gases impregnate the air filling the cavity. If this cavity has but limited communication with the outer air, then a local atmosphere is created, which, with the continued presence of the dead body, becomes continually more specific in character. This also occurs in vaults situated within or under churches. The gases and vapors which escape from the grave, and which emanate not only directly from the body, but also from the earth directly surrounding it, so far as this is impregnated with cadaveric fluids, escape therefrom in a horizontal position, wherever they find the least opposition, when the grave is closed above and the formation of gas exceeds the absorptive capacity of the earth. In this way, as has been proved by experience, they often penetrate into the cellar of a house, in the same manner as gas for lighting escapes from burst pipes in a thickly paved street. If no opposition is met with at the top of the grave, they escape directly into the air, whence, carried by the wind before they have time to become concentrated in a greater or less degree, they become diffused through the atmosphere. Their presence has been detected to the sense of smell hundreds of yards from the graveyard. At a great part of the year, these gases are cooler than the atmo-

sphere without, and on that account—perhaps, also, on account of the greater amount of carbonic acid which they contain—have no impulse to ascend *en masse* into the air, even though some parts, hydrogen, for instance, must soon rise. It cannot be stated at what distance from one or many graves it is necessary to be in order never to come in contact with emanations which are of physiological significance. The question now is, Are these emanations in question of essentially great consideration in a sanitary point of view?

The experience of our times seems to offer a negative reply; more exact researches, an affirmative one.

The *chemical* quality of atmospheric change caused by buried or entombed dead bodies, is as little well known as those caused by unburied ones. In the former, oxygen disappears, and carbonic acid, ammonia, sulphurate of hydrogen, and other unknown volatile matters (probably sebatic acid among them), are imparted to the air, so long as the walls of the grave are pervious to the gases—that is, so long as they are dry. Let the walls become soaked with water, and they partly absorb the ascending gases, and partly oppose their escape. Let the water evaporate, and the absorbed material also escapes with it. The *physiological* quality of the gases of the tomb and the grave rests partly on the absence of oxygen, partly on the admixture of foreign matters. In tombs, both characteristics offer themselves to our consideration; in graves in the open air, only the latter.

More or less important noxious influences from the gaseous emanations of interred dead bodies have, doubtless, been brought to notice. Here, however, we must leave out cases of suffocation within graves where, it is to be presumed, all the oxygen of the air had been consumed by the dead body; but, even then, cases not to be doubted still remain. These have a probable confirmation in cases of infection with contagious disease with which the body was affected, and also in cases of infection which could only be taken from cadaveric gases. Riecke has collected instances of both kinds which have withstood strong criticism. It is possible that the cadaveric gases, aside from contagious disease, are dangerous only under certain conditions—for instance, when containing certain medicinal substances; but we have no idea of the character of these conditions, and therefore must hold all cadaveric gases to be dangerous, even though hundreds remain uninjured in halls of dissection, in places of exhumation, and under similar circumstances.

When water from above penetrates the grave, and, percolating through the crevices and underlying stratum of earth, finds its way to springs, it may so infect them as to render them unfit for use; thus underground springs, which feed neighboring fountains and thence run off through drains, may become essentially impure if allowed to find ingress to the graves. The contents of shallow graves in spongy soil may be washed out by inundation, the bodies being thrown about at random. The infection of water through the grave may result from soluble or from suspended substances. Cases of such infection have often been observed.

But all this is but a rough sketch, according to our present insufficient knowledge, of isolated graves; not one of places where, for centuries or a less space of time, all burials have occurred under the systematic direction of municipal or of religious societies. These burial places are not to be considered under those conditions alone, whose outlines we have given, of isolated graves, but here we must still add another of great moment.



These places are not collections of graves only; the space made use of a long time previously is used anew for more recent interment; and, in preparing the new grave in the place of the old, there is brought to the surface, on the one hand, a soil that is no longer the original one, but which contains finely pulverized cadaveric matter; and, on the other hand, bones not yet crumbled into dust and still more or less rich in wholly or partially decomposed organic matter; and, finally, there are generally the remains of soft tissue, under the form of dark-looking fragments of various kinds. In many such places for interment, there are special places of reception for these bones, where, sometimes moistened by the rain, they finally decay; elsewhere they are shovelled into the new grave or some other place; and again they are left to lie and crumble on the surface of the earth, but the soil thrown out is, of course, with all its contained cadaveric matter, in different stages of oxydation, again thrown into the grave. This process, in course of years, is repeated time after time. By degrees there are collected a considerable mass of bones in different stages of decomposition, and, besides, the earth, after many repeated rotations in all its strata, contains a mixture in small particles or larger fragments of such substances as have been already mentioned, but of whose properties we have by no means complete knowledge. Together with this it also contains bits of the wood of coffins in different stages of decay, remnants of garments of the dead, etc. That such a place of graves should communicate to the air a mass of emanations whose nature is to be looked upon with suspicion—that it, together with the influence of water combined, differs in effect from a mere collection of undisturbed graves, is not to be questioned; but this fact is particularly to be distinguished, that, in this case, we have not only gases and moisture, but, at the same time, fine, solid molecules of cadaveric matter which the wind carries with it. Knowing this, no one will be surprised to hear of unendurable stenches arising from burial places long used. In Birmingham, not long ago, one such place emitted odors so disagreeable that its surface had to be covered with chloride and hydrate of lime.

The London Board of Health rendered great service in this direction, by fixing a limit to the fulness of places of interment.

From the gases and vapors of tombs, graves and burial places in general, these emanations, I repeat it, whose qualities in no single instance have been thoroughly known, but which have proved, here and there, injurious to health without our knowing what especial circumstances concurred to render them so, and which we are therefore compelled to look upon as dangerous *in toto*—from the noxious effect of these gases—it is our duty to protect society. For instance, we must prevent the water used for drinking and cooking from becoming infected through graves or any place used for interments.

How is this to be done? Absolute security we cannot guarantee. In the first place, we have too little knowledge of the matter, and next, it is only in exceptional cases that the outward conditions are sufficiently within our control.

First of all, official permission is to be a *sine qua non* condition on which the depositing and burial of the dead in private burial places, in preference to public ones, shall depend. The official permission for such proceeding shall be obtained from some authority connected with the Board of Health, and the judgment of this latter body shall be the standard of rule in such matters. It must be the business of this Board to draw from the lamentably inadequate physical, chemical and physio-

logical facts in regard to matters of interment, protective measures against noxious influences therefrom, and to make such measures available. Such protective measures are :

*First*—Prohibition of graves and tombs within dwelling houses and churches.

*Second*—Prohibition of tombs, not continually ventilated, destined for the successive reception of the dead.

*Third*—Prohibition of such isolated graves on private grounds as could render essentially impure the air or water in the vicinity.

*Fourth*—The exaction of the greatest possible distance of burial places in general, public ones in particular, from all dwellings ; and,

*Fifth*—From streams and springs.

*Sixth*—Exaction of deep and dry graves in soil sufficiently pulverulent in character.

*Seventh*—Prohibition of common graves, which remain partially or wholly open until full.

*Eighth*—A long period to be fixed as the limit of total decomposition.

*Ninth*—Controlling measures of the greatest possible security in regard to the undisturbed and sufficiently lengthy process of decomposition before the renewed use of the same grave.

*Tenth*—Prohibition of the careless and neglected exposure of bones.

*Eleventh*—Suitable precautions in the disinterment of bodies not totally decomposed.

*Twelfth*—The greatest possible accuracy in the estimate of space allotted to municipal or religious communities for purposes of interment.

*Thirteenth*—Prevention of too early use of disused burial places, whether excavated for deep foundations for buildings or used for buildings on foundations of less depth.

*Fourteenth*—Control of the management of burial places.

Articles one, two and three need no additional explanation. Especial attention is to be drawn to the private burial places mentioned in article three, which may be erected by individuals for their families, namely: tombs which, at other times perfectly closed, are opened from time to time for the reception of new occupants. The great danger to life to which the bearers of the corpse and their followers are exposed in entering the tomb is evident enough. That we may be able to oppose timely interference in the laying out of private burial places, all plans for such must be subject to approval of those authorities in whom is vested the power to control sanitary regulations, and, without being previously accepted by them, the use of such places shall be subject to heavy penalty of law. The first step towards obtaining such approval from these authorities must be to lay before them drawings and descriptions in detail of the plan, and an exact map of the location, upon which map dwelling houses and streams in the vicinity shall be indicated. For closed vaults of this kind the openings for ventilation, maintaining constant communication with the air without, must not be too small. In regard to the distance from places of residence, the same conditions will apply as in regard to public burial places; where graves instead of tombs are to be made, the neighborhood of streams of water is also to be considered.

In regard to article four, it is first of all to be remembered that mere distance cannot prevent fine, solid particles from being borne on the current of air, from the burial place into dwellings, even at a relatively great distance. Starting from this point, and having in view only

the attenuation of the volatile emanations out of the graves and soil of the burial place, it is proved that the distance in question cannot be decided by physical principles; according to them we can, at most, only deduce that the location in question, when situated in the quarter from whence the prevailing winds blow, should be more distant than when located in an opposite direction. Holding fast to this difference we must now seek to calculate the distance in some other way; to do this we should ascertain the distance from communities of the greatest number possible of such places devoted to interments as have been long in use, and whose odors have never been perceived in these communities. This whole procedure is in many respects unreliable, and must be applied to practical use only with great precaution, and still no other method, even somewhat objectionable, has yet been found. Legal calculations, thus far, have perhaps been founded partly on this principle, but are certainly also somewhat arbitrary; the difference in direction in regard to prevailing winds has nowhere been considered in these calculations, and we are by no means warranted in assuming that the given minimum distances are applicable when the location is towards the quarter of prevailing winds.

Under the conditions thus noticed the legal calculations here given are of no very important value, and are given only as examples:

The decree of the twenty-third Prairial XII required a distance of forty-five yards from the boundary limits of cities and towns.

The English law fixes that the distance of a burial place be not less than two hundred yards from the nearest dwelling-house, except with the consent of the occupant or owner of the latter.

In Prussia there are regulations fixing the distance at six hundred feet, one thousand steps, etc., but there is no general law for the whole country.

Where there is no law it is of course better to fix upon the maximum rather than the minimum distance in the selection of a location; if it prove greater than necessary, there is only the disadvantage of inconvenience to friends and followers to the tomb; while, if it be not great enough, very serious consequences may result.

The original remoteness of the burial place from the community often becomes lessened by the growth of the latter, until it finally includes the former. This may be prevented by determining beforehand that no dwelling house shall be erected within a definite distance of the burial place without permission, power to grant which shall be vested in the municipal authorities. Such a law was passed in France in March, eighteen hundred and eight. It is, however, not judicious thus to limit the use of land, and it would, perhaps, be better, in cases where dwellings have shut in or approached the vicinity of burial places, to recommend the removal of the latter. Of course those who build from choice in the neighborhood of a burial place, have no right to demand its closure.

Under many circumstances it would be very desirable if the right of expropriation might be made available for the acquisition of a place well adapted to burials; but this is nowhere, or in but few places, the case in regard to the establishment of places for interment.

Article five—Streams and springs are rendered dangerous by graves or by burial places, when subterranean water constantly or repeatedly penetrates into the graves, and when water used for artificial fountains passes through the graves or through the soil of the burial place, thence

finding its way to some running stream. Dilution of the watery solution *can* render it ineffective, but it *may* not do so.

The upper layer of earth may be so fine-grained and absorbent in nature as to retain the comparatively small quantities of water falling from artificial fountains, never becoming so saturated as to allow it to soak through to the level of the underground streams. Such, of course, would not come under this head; but let this stratum of earth be of insufficient depth, then, in long or heavy rains especially, it gives passage to an infected filtration upon the underlying stratum.

The presence of subterranean water on a level with, or near the bottom of the graves, may be determined by digging in the least elevated part of the land to a depth of seven or eight feet; the water may, however, often rise to this level without being discovered in such excavation; still this is our only method of procedure.

Thus we see that a fountain in the midst of a burial place may remain intact, while one at a distance may soon become offensive.

Article six—The depth of a grave cannot be regulated according to exact principles. Present official regulations vary much, and the depth prescribed neither rests upon such principles nor upon such knowledge, derived from experiment, as to guarantee against harm. The deeper the grave, so much slower the interchange of gases between it and the external atmosphere, which, other circumstances being the same, for this reason is less impregnated with matters emanating from the grave. The graves of children must not be more shallow than other graves. If it is impossible to bury the body at any definite depth required, on account of reaching water or very moist soil, then, of course, earth is to be heaped upon the grave. In doing this it is to be borne in mind that all heaps of earth *settle*—that is, they diminish in height in the course of time—for which allowance must be made either then or subsequently.

Wet graves, firstly, render water unsafe; secondly, at times they present masses of corruption; and, finally, they cannot be included in proximate calculations in regard to the period of limitation of decomposition. Those locations where graves would probably be wet should be avoided in the selection of burial places. To aid in determining this before the location is fixed upon, the ground should be excavated in different places to the depth of seven or eight feet, and information obtained of the greatest height of standing water observed, either upon the ground or in the vicinity. Where the component parts of the soil are of such size as to render the interstices large, the dead bodies are easily wet by the rain, and the air is quickly and largely impregnated with cadaveric gases.

Article seven needs no discussion. The nuisance referred to is more common in European countries than in our own.

Article eight—The so-called period of limitation of decomposition varies chiefly according to soil. This can never be previously determined. Sometimes it becomes necessary to enlarge an already existing burial place, by inclosing additional ground of similar character. If, in such a case, it is desired to fix the period of limitation, from experimental knowledge, the question always arises, In what condition shall we look upon a body as decomposed? and here the difficulty presents itself of fixing upon a period when the organic matter of the soft parts is completely decomposed—that is, so that, moistened with water, it will not again emit an offensive smell. Almost everything in this respect is purely subjective. The decomposition of the organic substance of the bones

is not to be awaited. In the excavations at Pompeii, bones have been found from which glue was obtained. In general, the term of limitation adopted is from five to thirty years. The extreme uncertainty upon this point is a circumstance of great perplexity to any body of men having in charge the public health, since it makes impossible a rational estimate of space for burial requisite for a certain population, and leads eventually to the too early renewed use of graves. In an economical point of view, also, is this uncertainty to be regretted. If there is an attempt at great security, and hence a long period for the limitation of decomposition be fixed upon, this involves the purchase of a large, often expensive, tract of land, which, in reality, may prove unnecessary. The so-called family burial lots—"hereditary tombs," set apart, once for all, for the reception of present generations and those to come, involving the repeated use of graves and the piling of coffins, one upon another, within the tomb—should demand special consideration.

Article nine—The most liberal allotment of land for long decomposition is of no avail if, on account of burials subject to no regulations, and the absence of any controlling authority, after the lapse of a few years it is no longer known how old the graves are. For this reason, measures should be adopted for immediately, at any time, being able to ascertain the date of the last burial within a grave. This may be managed in different ways. There must always be a controlling officer present, that it may not depend upon the sexton whether older or more recent graves are opened.

The point involved in article ten demands scarcely a word. It is merely to be remarked that it is much better to re-bury the bones deep in the earth than to collect them in a receptacle built for the purpose, where they are exposed to atmospheric influence, and eventually, perhaps, are carried off by some animal. It were better to strictly forbid the construction of such receptacles.

The point involved in article eleven comes under consideration in cases of legal disinterment, necessary removal of a burial place or of a body. It is here only to be recommended that the person digging shall so place himself that the wind shall carry the gases away from him. Chloride of lime water can also be used. Although such disinterments, of a very extensive character, have occurred without detriment to adjacent precincts, yet they should always command the serious attention of sanitary officers.

Article twelve—For the greatest possible accuracy in the estimate of space to be set apart for the burial place of a community, it must first be ascertained how much land is required for family burial lots or tombs; this required space must then be added to that computed sufficient for the whole community, thus rendering it unnecessary to change the computation, either on account of miscalculation of space demanded for private lots, or of the number of inhabitants allotted to them. Having ascertained the space required for private ownership, the next step is to ascertain the number of inhabitants and statistics of their mortality, preferring for the latter an abnormally high standard, thus computing the annual number of interments. Of course, where the population rapidly increases by immigration, the existing number of inhabitants is of no use for reckoning future needs; but if it is desired to make a computation which shall allow something for this, let the population be reckoned one-third, one-half, or even one hundred per cent. greater. We now multiply the number of years allowed as the period of limitation for decomposition by the number of annual interments. The next question

is, what shall be the average area allotted to each grave, and how much area is to be devoted to paths and walks. Different existing official regulations vary much in their normal calculations of area. Next, it is necessary to come to an agreement whether the space calculated for each dead body shall be that requisite for an adult, or if, in order to economize space, an average shall be made. Riecke's plan for obtaining an average is as follows: Take one body of maximum size from each of three stages of life, reckoning in the account the corresponding rate of mortality of each stage; for instance, let thirty years be adopted as the period of limitation of decomposition; then make a calculation from statistics of the number of deaths that will occur in the community in those thirty years; of these deaths a certain number will be children under seven years of age, each of whom will require on an average a certain area; multiply this area by the number of children, and the product will be the space required for them, represented, let us say, by the letter  $x$ ; then we compute the number of deaths which will occur between the ages of seven and fourteen years of age, multiply the average space required for one of these by this number of deaths, and our product,  $y$ , will represent the area requisite for them; next, the number of deaths of persons over fourteen years of age, calculate in the same way the area necessary for them, represented by  $z$ . We now find that the sum of  $x+y+z$  = the whole area needed for burials; this, divided by the total number of computed deaths, will give the average area for one body. For paths, etc., calculate an addition of one-eighth of the total area needed for deposit of the bodies. Where economy or other circumstances do not demand otherwise, it would, perhaps, be better to calculate all the graves as for adults. The question now arises, how shall we compute the area necessary either for an adult or a child. Let us take the former as example. Here the average length of the body is about five feet three inches, the breadth across the shoulders and pelvis about one foot eight inches; allowing the space of one and one-half inches in length and breadth within the coffin, we have about five feet four and one-half inches in length by about one foot nine and one-half inches in breadth; add to these one and one fourth inches allowed for the thickness of the walls of the coffin, and we have in length five feet five and three-fourths inches by a breadth of one foot ten and three-fourths inches, making the square area of the coffin about ten and two-fifths square feet; in order that the coffin may be lowered into the grave without rubbing against the sides, the grave must be at least four inches larger in length and breadth, making it five feet nine and three-fourths inches in length by two feet two and three-fourths inches in breadth, thus giving an area of about thirteen square feet. This, however, is but the *superficial* area.

Taking it for granted that the soil is of such a character that an excavation, with vertical walls, can be made to the depth of from seven to seven and one-half feet, and we have still to calculate for an intermediate distance between graves, for the purpose of securing the individuality of the grave already occupied from that newly made, and at the same time to prevent the gases from the occupied grave from passing in greater volume through the sides than through the roof of the grave. If the division walls between the graves have a much less thickness than the roof—which should be about six feet thick—then, in digging the new grave, the gases will seek the easiest way to the open air, namely, through the sides of the grave. To prevent this, the intervening dis-

tance on every side must be about six feet, or three feet around each grave, thus making the total superficial area about forty-six and one-quarter square feet, or a little less than five and one-quarter square yards. By diminishing the intervening distance between the graves, the superficial area will of course be diminished also.

As it is scarcely possible to sink a grave of the depth mentioned, with vertical walls, without their caving in, it is better to make the excavation with sloping sides. The angle of these escarps depends upon the consistency of the soil, varying from thirty-two to seventy-five degrees, the former answering for dry sand, the latter for solid earth. The less the angle (the distance between graves being as above reckoned), so much more does the new grave take from the upper wall or roof of the old grave, during the time it is being excavated, and that it remains open. If it is desired to prevent trespassing at all upon the old grave, then, if the soil be spongy, there must be a greater square area allowed for each grave, or the walls at the side, sloping but little, or none at all, must be furnished with supports.

Article thirteen—If we now consider the condition of the soil of a long-used burial place, the cadaveric matters contained in it, in their various stages of chemical decomposition, and then suppose the case that they make their escape out of this soil into the air of an illy-ventilated room, no one would desire to experience the effect in order to decide that the atmosphere of such a place would be noxious to a high degree, even were it only a question of the carbonic acid gas. Cases are known where essential injury has been suffered from the air of houses too early built upon the site of a disused burial ground. This has led the official authorities of some places to forbid the too early occupation of such places with dwelling houses; as well, also, as to forbid the deep turning up of the soil thereof. Here, also, it is easy to perceive, a period of limitation equally applicable to all places cannot rationally be fixed. Even after a lapse of forty years, detrimental consequences might result from building on such a site; yet, if necessary to fix a limit, here and there forty years might be allowed as the normal term. Thus, abandoned burial grounds, if no principle of piety forbids, may be converted into fields and gardens, always, however, without allowing the soil to be deeply dug up.

Article fourteen—The control of burial places must be placed under the systematic management of sanitary authorities; otherwise we shall perhaps find one temporary manager inaugurating common graves instead of the previous single graves, while, to his successor, it will be a matter of indifference that the place is already overfilled with the dead, so that the upper coffin is almost exposed to the air. The duty of a systematic controlling power will extend to overseeing the depth of new graves, and preventing disturbance of the soil of older ones.

It is a matter of no importance whether the burial place be inclosed or not; also, whether the inclosure be of masonry, a green hedge, wooden fence or paling, or anything else.

The act of burial of the dead—that is, of transportation of the dead to place of burial—is also a matter of moment to the sanitary authorities. There are burial places so situated that a part of the way, at least, is impassable for carriages, and hence the coffin must be borne. Elsewhere, custom dictates the carrying of the coffin, in some places even selecting children as pall-bearers of their playmates. The scientific reader needs not that we discuss the possible consequences of this custom. It is for us to do all in our power to abolish it.

Complaints have sometimes been made against undertakers by their neighbors, both on account of offensive odor of the paraphernalia used by them, and on account of their infecting power. The latter, even in case of the pall used to cover the dead, which may come in contact with cadaveric fluids, need be no cause of fear to those in the neighborhood, and, by washing and airing them, those who handle these articles will be secure. Offensive odors are also destroyed by sufficient cleansing with water.



## THE "SOCIAL EVIL" QUESTION.

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[The following correspondence and treatment of this subject by Arthur B. Stout, M. D., of San Francisco, already alluded to in this report, explains itself. The paper, it will be seen, was prepared at the instance of a member of the Legislature of Nevada, but not having been ready in time for the action of that body, who disposed of the question in the negative, it was read before the Section on Hygiene, at the late meeting of the American Medical Association in San Francisco, and received the indorsement of that Committee, with a recommendation that it be appropriated to the uses of the State Board of Health of California.]

SAN FRANCISCO, February, 1871.

*Hon. J. D. Burlingame, Nevada:*

DEAR SIR: In compliance with the request of Mr. B. C. Whitman, of Carson City, and learning from him that the Legislature of the State of Nevada proposes "to examine the question of regulating houses of prostitution," I take the liberty to address you upon the subject. Lest I should appear to obtrude without invitation the views I offer, a copy of Mr. Whitman's letter is herewith attached:

CARSON CITY, Nev., January 16th, 1871.

MY DEAR SIR: The Legislature of the State proposes to examine the question of regulating houses of prostitution, and desires such statistics of French and other laws as can be obtained.

Mr. J. D. Burlingame, of the Assembly, has spoken to me on the subject, and I have told him that I thought you could assist him in the matter. If not too much trouble, will you furnish him such information as you may have, or direct him to such sources of knowledge as may be available?

I remain, your obedient servant,

B. C. WHITMAN.

DR. ARTHUR B. STOUT, San Francisco.

It is indeed greatly to the honor of American legislators that previous to the enactment of statutes they seek to collect the facts of experience and from them derive new laws. On this basis the hope may be realized that American institutions will excel those of every other nation. Inoperative statutes exhaust confidence in law. They are very costly to make, a great burden to enact; and a useless encumbrance to the Code. Unavailable laws appear rather to provoke litigation than

suppress disorder. The easy appeal in Courts from decisions which seem to conflict, or are made for mercenary purposes to appear so, with the privileges of equality or the rights of man, renders the remedy for misdemeanor very protracted and expensive. Oftentimes the result of a long trial reveals the most mortifying fact that the sumptuary statute is unconstitutional. In the meanwhile, however, the misdemeanor against which the law has been enacted proceeds with accelerated speed. The history of legislation, as manifested in suppressive laws with retributive penalties against prostitution, clearly indicates that the "social evil" cannot be removed by that intervention. Legislation may embarrass, irritate, exasperate; but the evasions it gives rise to introduce crimes in addition to misdemeanors, and create a long series of more serious disorders on the police record.

For the sake of brevity, and to avoid citation of authorities and long quotations, I forward for your perusal Sanger's admirable History of Prostitution. It may be fairly considered as exhaustive of the ancient and modern history of the subject. The collateral history of the second great "social evil" which prostitution has evolved, viz: the diseases which grow and are propagated from it, are amply therein considered. The moral fear of the one is nearly equally measured by the physical terror of the other. They march in concert. In fact, in political economy they become one question. The exact relations which have prevailed and been accepted as social or moral between marriage and an uncontrolled intercourse of the sexes in the most remote ages, cannot be easily defined. Certain it is that the wildest and most opposite customs have been tolerated and accepted. The history of those times shows that prostitution, with its attendant fearful diseases, prevailed in the most princely families and orders of men. The religious classes did not form exceptions, and the same histories disclose the facts, constantly repeated, that direct legislation has always proved a failure. The failure has always been and probably always will be found, firstly, in the extreme intricacy of the subject, and, secondly, in the great fallibility of the agents employed to administer the law. In ancient states of society the practices of all countries, the feasts and atrocities of the Lupercalia and like ceremonies dedicated to Venus, prove that wedlock was not regarded publicly with the same austere severity as in the present age of Christianity. And it was just in those epochs of all nations that the world was scourged with the most terrific forms of venereal diseases. They prevailed in the noblest classes; they must have prevailed still more extensively in the humblest, because the universality of disease made it common to all. The poor were no more virtuous nor discreet than the rich, in the observance of their marital vows. Again, the history of the "social evil" in all countries shows that its absolute suppression is impossible. It defies statute law, evades moral and religious law, and escapes from the conventional social law.

Hence its gradual repression is all that can be attained, and that only through a non-coercive system. Under imperial governments, coercion may avail somewhat, for the force can be applied irrespective of the rights and privileges of freemen. Again, in large cities where the population is very dense, and poverty prevails in consequence of the product of labor being less than the requirements of living, the authorities are cheerfully invested with greater police power; but republican institutions do not afford the same facilities. Herein every man is the free arbiter of his own acts, and of his own health. You cannot compel him to be officially prudent, to be clean, nor to eat by regulation. His house

...not enter to search his premises, much less exam-  
 ...to his health, except under a legal criminal  
 ...Constitution he is free to provide for his life, lib-  
 ...according to his own volition. In disease, he is free  
 ...; and if he confide in a physician, the latter is  
 ...the confidence sacred, and no authority can com-  
 ...facts indelibly on record. Each person is free to  
 ...treatment; he may apply his own remedies or may  
 ...ative powers of nature. Now, what is true of men  
 ...to the rights of women.

...of prostitution are asked for, as well as upon  
 ...the "morbus gallicus," a sinister glance is  
 ...ance" for original information. This is a libel and  
 ...atcheon of that nation. The birthplace of the pest  
 ...it known whether it was first born of man or woman.  
 ...ful ignorance, for the knowledge of its origin would  
 ...to its cure. Born of filth and lewdness somewhere,  
 ...universal by prejudice and ignorance. To the vindi-  
 ...France, however, it is proved that it existed to a frightful  
 ...America, among the ancient Aztecs of Mexico, long before the  
 ...America of Christopher Columbus. We find in the elegant  
 ...history of Mexico, before the advent of Columbus, and  
 ...by the Abbé Brasseur de Bourbourg, the following note (vol. 1,

Tecamaches, who represented themselves in their traditions as  
 ...of the Pyramids of Téotihuacan, were the first emigrants  
 ...moxta. They were the first who cultivated the soil of the  
 ...Anahuac, where subsequently so many other tribes were des-  
 ...succeed them. At an early period, also, the chiefs of the  
 ...Tamoanchan appeared, because long before the foundation of  
 ...Empire people came from that region to Téotihuacan to offer

It is also in this city, rendered sacred by several titles, that  
 ...Princes were buried and their successors elected. These are  
 ...data which throw light upon the primitive history of Anahuac.  
 ...here that one of the most extraordinary episodes, under the  
 ...allegory, is recorded. It is the Apotheosis of Nanahuatl, and  
 ...morphosis into the God of the Sun. The ceremony took place  
 ...huacan. The gods assembled there. Their object was to con-  
 ...reapparition of the sun, the sight of which they had been for  
 ...deprived. A sacrifice was required to conciliate the orb of  
 ...obtain his reappearance above the horizon. For this object it  
 ...necessary that a god should be immolated. The sacrificial pyre  
 ...glutted. The one who possessed the courage to cast himself into  
 ...would merit the honors of Apotheosis, for from his ashes would  
 ...the God of Light. Among the others Nanahuatl was pres-  
 ...ill with a direful incurable malady. There was nothing to  
 ...him to life, for he had exhausted all its joys. But yet he hesi-  
 ...The others encouraged him, saying, 'To thee it is to protect the  
 ...and the earth' He plunges into the flames and is instantly  
 ...ed. Metzli, his companion, imitates his example, and shortly  
 ...brilliant star of day, again to fertilize nature, appeared in

From that time the honors consecrated to the sun were  
 ...with those dedicated to Nanahuatl, and those which were

offered up to the moon were equally awarded to Metzli, who had imitated his courage."

It is shown in the same work that the malady of Nanahuatl was the worst form of syphilis. Indeed, he is called in the ancient histories the "Buboso." To escape the horrible tortures of his disease he accepted the actual cautery of incineration. He purchased this deification cheaply, and those poor idolators, in their ignorance, assuaged his pains with celestial honors.

The inference to be drawn from this statement is, that in former ages prostitution and its maladies existed to a far greater extent than at present; that the marriage union was less respected, and that suppressive laws were of no avail.

It is one of the greatest triumphs of the Christian era to have abated this evil. Under the benign influences of Christianity its first amelioration was wrought. No thanks to the Papacy, however, of the early centuries. Its intolerance punished, but its benevolence never contributed to heal the ill. Prostitution and syphilis had full sway. The nation falsely accused of the origin was the first to attempt with philanthropic succor to assuage, if not to extirpate, the world-wide misery; and France will forever wear the honor of having inaugurated the first great public efforts to counteract the ravages of the disease. Moreover, it was France, under the Republic, which took this initiative, and hence it is republican institutions and principles which may claim the glory of the reform.

The "social evil," then, existed long anterior to the Christian era, but only under the benevolent influences of that faith has it received mitigation. How much more may be done remains to be shown.

Under this aspect of affairs it is evident that while coercive laws have failed, philanthropic influences and benevolent institutions have prevailed. It may be safe to assert, therefore, that since the middle of the sixteenth century the gross amount of prostitution and syphilis in the world has been more than one-half abated. It may also be safely averred that the careful study of the latter disease by the medical profession of all nations within the last century, disclosing its appearance in all its phases and learning its cure through its varied complications, has well nigh divested the malady of its horrors, and left impotent for general harm a disease which in former epochs was the opprobrium and the terror of mankind. As it is the purpose of the political economist to act *for* the State and not *against* individuals, the object of the suppression of prostitution is threefold: Firstly, to improve the moral condition of the State and lessen crime; secondly, to promote legitimate marriage and increase the ratio of families; and thirdly, to diminish the diseases, in their immediate and hereditary forms, which grow out of the "social evil." If these objects can be attained the wealth of the State and its moral force are augmented; while also the race of men will become stronger, healthier, and enjoy a longer duration of life. The analysis in detail of this threefold object will show how rapidly a State may degenerate under the influence of this cause of decay alone, and irrespective of all other causes; and conversely, how the rational promotion of the same objects will enhance its moral and physical greatness.

Having sufficiently adverted to the past, the inquiry is turned to the future. The great remedy is to be derived from the principal causes. These are, with occasional exceptions, *ignorance and poverty*. The direct remedy of the one is the direct cure of the other.

Parent Duchatelet (see Sanger's History of Prostitution, Ch. 10, p. 141) gives the following table of causes :

- Want, one thousand four hundred and forty-one cases.
- Expulsion from home or desertion of parents, one thousand two hundred and fifty-five cases.
- Desire to support old and infirm parents, thirty-seven cases.
- Desire to support younger relations, twenty-nine cases.
- Widows with families to support, twenty-three cases.
- Girls from the country, to support themselves, two hundred and eighty cases.
- Girls from the country, brought by others, four hundred and four cases.
- Servants seduced and abandoned, two hundred and eighty-nine cases.
- Women abandoned by their lovers, one thousand four hundred and twenty-five cases.

This statement shows that to want and to ignorance (the most prolific parent of want) is to be attributed the "social evil" The diminution of these causes, by the philanthropies and the increase of profitable industries, is the explanation of the decrease in the last centuries of this evil and the great improvement in social life.

No woman chooses, of her own volition, the "social evil" for her mode of living. She is impelled to it in ignorance or driven to it by destitution. Her only protectors are her innate sense of modesty and love of virtue, together with her natural pride of high social position. When these sentiments are highly educated, her power of self-protection is increased. As they are neglected, her defences are weakened. If this be true, it is plain that direct coercive legislation can avail but little, while an indirect persuasive legislation, acting upon whole communities rather than on individuals, is the true system by which to reduce the evil to its minimum degree. Again, as regards the application of legislative restrictions and penalties, the idea may be justly advanced that woman, by the very fact of her fall, is sufficiently condemned, and atones by griefs and sorrows more profound than any legislation can inflict. Let, then, the artillery of the law be aimed against those who more deserve its force, because it is manifest that if men will refrain from visiting the houses of reception, such institutions must necessarily cease to exist. Like bad newspapers, which only thrive because worse people buy them; stop the subscription and the evil print expires. A State that would derive any emolument from its repressive laws would at once become a "*particeps criminis*." The State that would condescend to draw a profit from the evil, either in form of punishment or to reimburse expenses, or even withal to endow charitable institutions, would fall from dignity. To license is to encourage.

If the views taken are correct, it follows that the question of the "social evil" resolves itself into the question of public education, and as a consequence, that whatever legislative action conduces to advance the latter contributes indirectly to cure the former. The statistics show the majority of victims are taken from the young, ignorant and untaught, and in Europe from the peasant class. Their innocence is captured through their ignorance. Instruction, then, directed to that especial class, becomes the surest preventive. If a law could make it imperative upon parents to devote the youth of their children, especially to obtaining a useful practical education—a law which

would not permit parents to sacrifice the youth of their children to labor for their profit, but require it to be dedicated to the prospective profit of the children themselves, whose time is really their own property—then would progress be made. If the enactment of such laws be inexpedient, then by the establishment of public schools in every county and town in the State, continued open in both winter and summer, the next best approach to improvement is made.

The great diminution in the amount as well as the virulence of the venereal maladies in the present, as compared with the ancient times, and the power exercised over the disease, as well on its primitive forms as its hereditary transmission, by medical treatment, evidently allows the inference that still greater mitigation of the evil may be effected.

The squalid poverty and filth of former ages no longer exist in our more favored country. In a comparative view, the poor of our country are all rich. But yet reformatory legislation may very much accelerate the progress of improvement. To this end the establishment of hygienic institutions to which the afflicted may easily resort, without the necessity of a record or register of their affliction, will render benefit. The disgrace and secrecy which accompany contamination contribute immensely to prolong and intensify the evil, and very few are willing to make a public record of a mortifying fact. Let, then, the cure be made as private for the indigent as the rich. In large towns hospitals and dispensaries should be opened, of easy access to all parts of the place; and in counties, a County Physician, with an ample salary, should visit through the county, whose services would be free to the poor. The magnificent public baths of ancient Rome are an institution which would do honor to our philanthropic age. It was, perhaps, this very matter that led the statesmen of that epoch to call them into existence. The religious orders of those times were clever enough to convert to their uses the thermal springs of their respective countries, and, by investing them with the idea of divine visitations, won the merit and the profits of divine cures.

If then, sir, in your State, the Legislature would appropriate some thermal springs of acknowledged efficacy, and devote them to public use, with free accommodations for the indigent, and as a State Hospital to which the poor sick of the State might resort at a very low cost, or for nothing, and even in extreme cases give free transport to the locality, more absolute relief and benefit would be done to the State than by direct legislation against the "social evil."

At present such resorts are occupied as private property, and are only accessible to those who have ample means to pay for their enjoyment.

The magnitude and importance of the subject is my apology for treating it with diffuseness.

I remain, very respectfully, yours,

ARTHUR B. STOUT, M. D.

SAN FRANCISCO, February 10th, 1871.

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The accompanying bill, introduced before the Legislature of Nevada, February twentieth, eighteen hundred and seventy-one, passed the House, but failed to pass the Senate. It was received after the forego-

ing statements were written. If my previous observations contain any force, the utter impracticability of such a statute must be apparent. Its onerous machinery requires that over a State whose area is ninety-nine thousand five hundred and thirty-nine square miles, divided into fourteen counties, fourteen physicians are to make a tour of inspection every two weeks. As many County Sheriffs, Auditors, Boards of Commissioners and Treasurers are to issue licenses, collect moneys, give certificates and form as many "Bawdy-house Funds." Certificates of health, to be exhibited on demand, are to be issued. Any other than the legally appointed physicians, who should give a certificate, to be fined or imprisoned. The appointed physicians must take oath of faithful performance of duty and give bonds. It is further provided that these gentlemen shall not conduct themselves "in a rude or libidinous manner"—a most remarkable statutory insinuation against medical men, who must firstly be well accredited and also take oath and give bonds. In cases of delinquency, citations must be served by Sheriffs or Constables, and Justices of the Peace must subpoena witnesses, who are compelled to testify, even to their own complicity.

A singular monopoly of medical practice must also ensue, for it appears that the examining physicians are empowered to treat all cases of disease they may discover, gratuitously to the invalid but chargeable to the "Bawdy-house Fund." If the morality of the new State of Nevada requires such stringent legislation, the fourteen Bawdy-house Funds must be carefully looked to in order to requite these medical services, for a single patient might exhaust a county fund.

Numerous other points of objection might be taken against this Assembly Bill No. 199, but I willingly refrain from prolonged comment.

The bill is stated to have been based on a similar statute in another State. If it is the contagious nature of such enactments that they become propagated in other States by the influence of precedent, the subject becomes worthy of the careful consideration of the American Medical Association.

#### AN ACT TO REGULATE HOUSES OF PROSTITUTION.

*The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:*

SECTION 1. Any person or persons who shall open, keep or carry on any bawdy house or place for purposes of prostitution, shall obtain a license from the Sheriff of the county in which such bawdy house or other place of prostitution may be kept or carried on, and shall pay therefor the sum of \_\_\_\_\_ per month, which license shall be granted for three, six or twelve months, at the option of the person applying for such license, and which shall be issued and accounted for by said Sheriff, as is by law provided in respect to other county licenses, so far as the same is not inconsistent with the provisions of this Act.

Sec. 2. Any person, being an inmate of any bawdy house, submitting to or offering herself for purposes of prostitution, shall submit to an examination and obtain a certificate of health, from a physician appointed as provided, once in every two weeks; and shall pay to said \_\_\_\_\_ for the sum of \_\_\_\_\_ dollars, and shall keep such certificate the same at any and all times, when required so to do. \_\_\_\_\_ County Auditor shall prepare and cause to be printed a \_\_\_\_\_ of blank licenses mentioned in section one of this Act,

which shall be signed, issued and accounted for in the same manner as is by law provided in respect to other county licenses, and all laws now in force or which may hereafter be enacted in relation to the collection of moneys provided by law to be paid for other county licenses, so far as the same are not inconsistent with the provisions of this Act, shall be applicable to the collection of the money provided to be paid for license by section one of this Act. The County Auditor shall also prepare and cause to be printed blank certificates of health for the use of the examining physician, which shall be in convenient form, and shall express the amount required to be paid therefor by the preceding section. Said Auditor shall from time to time, when needed, countersign and issue to the examining physician so many of such blank certificates as he may need, taking his receipt therefor and charging him therewith.

SEC. 4. No certificate other than that mentioned in the preceding section shall be used or given for the purpose mentioned in section two of this Act, and any examining physician who shall issue any certificate contrary to the spirit and intention of this Act, or who shall receive the amount required to be paid by said section two, without delivering the proper receipt, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than fifty nor more than five hundred dollars, or by imprisonment in the county jail for a term not exceeding three months.

SEC. 5. If any person shall keep or carry on, or cause to be kept or carried on, any house or place for purposes of prostitution, or shall knowingly permit the practise of prostitution in or about his or her residence, without first having procured a license, as provided in section one of this Act, he or she shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined in any sum not less than ten nor more than one hundred dollars.

SEC. 6. If any person, being an inmate of any bawdy house for purposes of prostitution, shall refuse to submit to an examination in such manner as may be prescribed or required by the examining physician, or shall practise or offer herself for prostitution without first having obtained a certificate of health from said physician, as provided in section two of this Act, such person shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not less than ten nor more than fifty dollars, or by imprisonment in the county jail not exceeding three months, or by both such fine and imprisonment.

SEC. 7. Any person keeping or carrying on any bawdy house under and by virtue of a license provided for in section two of this Act, who shall practise prostitution without having obtained a certificate of health, as provided for in section two of this Act, or who shall knowingly suffer or permit any other person to offer herself for purposes of prostitution in or about such house, without such person has obtained such certificate of health, or who shall practise or knowingly suffer or permit any other person to practise prostitution in or about such house while infected with any venereal or other infectious or contagious disease, such person shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished as provided in section — of this Act, and in addition shall forfeit such license.

SEC. 8. It is hereby made the duty of the Board of County Commissioners of each county in this State, in which there may be kept or carried on any licensed house or houses of prostitution, at their first session after they shall be informed that such license or licenses have been



issued, to appoint some competent practising physician, resident of such county, as examining physician, and shall fix the rate of compensation such physician shall receive for his services, which shall be audited and paid from the fund created by the provisions of this Act, in the same manner as other bills against the county. Said physician shall, before entering upon his duties, take the oath of office prescribed by law, and also that he will faithfully perform his duties as such examining physician. He shall also be required to execute a bond in a penal sum of not less than one thousand dollars, to be approved by the Board of County Commissioners, conditioned for the faithful performance of his duties, as prescribed by law; *provided*, that any such appointment may be revoked at the discretion of said Board of County Commissioners; and *provided* further, that if it shall be proved by competent testimony that any physician appointed as in this section provided is incompetent, or neglects to perform all the duties required of him by the provisions of this Act, then it shall be the duty of said Board of County Commissioners to remove such physician and appoint another.

SEC. 9. It shall be the duty of the examining physician appointed, as provided in the preceding section, to procure from the Sheriff of his county a list of all bawdy houses for which such Sheriff has issued licenses, as provided in section one of this Act, and to visit each and every one of said houses at least once in every two weeks, and examine each and every person in said house who may be there for the purpose of prostitution, and shall furnish a certificate of health to each of such persons as in his opinion are free from any venereal, infectious or contagious diseases, upon the payment to him of the sum required to be paid by section two of this Act. Said physician shall, on the first Monday of each month, pay over to the County Treasurer of the county all moneys received by him for certificates of health issued during the preceding month, taking duplicate receipts therefor, one of which receipts he shall on the same day file with the County Auditor. He shall also, on the first Monday of each month, deliver a written report to the Board of County Commissioners, in which shall be specified the number of certificates of health granted, and the number and names of all persons examined and found diseased during the preceding month. It shall also be the duty of said physician to immediately report to the Justice of the Peace of the township in which any bawdy house may be situated, the name or names of any person or persons found in any such house, who in his opinion are there for the purpose of prostitution, who refuse to submit to an examination, or to comply with the provisions of section two of this Act; *provided*, that in no case shall such physician conduct any such examination in a rude or libidinous manner, or require any such person to submit to any examination other than such as is actually necessary for detection of the existence of venereal, infectious or contagious disease.

SEC. 10. It is hereby made the duty of the Justice of the Peace of any township in this State, upon receiving a report from the examining physician of his county, as prescribed in the preceding section, to cite any person or persons so reported to him by said physician to appear forthwith, or at a subsequent period, not to exceed three days, in relation thereto. Such citation may be served by the Constable of the county, and shall be served by delivering a copy of each of the persons named in the citation, personally to each of the persons named by subpoena the physician to him, or any other person who shall have reliable

information or knows anything about the matter, to appear before him and testify in the case. Such subpoena shall be served in the same manner required in the service of other subpoenas in similar cases. If upon examination said Justice of the Peace is satisfied that any of such persons were not in a bawdy house for the purposes of prostitution, then such person shall be released; but if he shall be satisfied that any of such persons were there for purposes of prostitution, then he shall order such person to submit to an examination by said examining physician, and to comply with the provisions of this Act within twenty-four hours from the time such judgment is rendered; and in case of a wilful neglect or refusal by such person or persons to obey the order of citation or the judgment of the Court, such person shall be deemed in contempt of such Justice of the Peace, and may be proceeded against as in other cases of contempt in criminal cases in Justices' Courts. For services rendered under the provisions of this section, such fees shall be allowed as for similar services, to be taxed and collected as other fees in criminal cases before Justices of the Peace; *provided*, that in no case shall said physician be liable for any costs incurred in any such proceeding.

SEC. 11. All moneys received for licenses and certificates of health, under the provisions of this Act, and all moneys received for fines imposed for any violation of this Act, shall be paid into the county treasury. It is hereby made the duty of the County Treasurer of any county of this State to place all such moneys in a separate fund, to be known as the Bawdy-house Fund, and to keep an account thereof, and to pay all warrants drawn thereon as provided in this Act.

SEC. 12. It is hereby made the duty of the Board of County Commissioners of each county of this State, upon the report of the examining physicians of their county that any person or persons, inmates of a bawdy house for the purposes of prostitution, have been examined by him and found diseased, to provide for the care, medical attendance and maintenance of such person or persons; and all expenses incurred for medical attendance, care or maintenance of such person or persons, shall be paid out of the Bawdy-house Fund. All claims against said fund shall be audited and allowed in the same manner as other claims against the county; *provided*, that all moneys appropriated out of said fund, except for compensation of the examining physician, shall be for medical attendance, care and maintenance of diseased prostitutes, who at the time of contracting such disease were inmates of some bawdy house in the county to which she may apply, and procured a certificate of health from the examining physician of said county; and *provided* further, that in no case shall any claim provided to be paid out of the fund herein created, be paid from any other funds of the county.

SEC. 13. No town, city or municipal corporation in this State shall hereafter have power to prohibit or suppress any house of prostitution licensed as provided by this Act.

SEC. 14. No person, otherwise competent as a witness, shall be disqualified or excused from testifying as such before any Court or Justice of the Peace, to any facts concerning the offences mentioned in the foregoing sections of this Act, on the grounds that his testimony may criminate himself.

## REPORT ON CHINESE IMMIGRATION.

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"If we Americans of to-day turn from the splendid sunrise of our national morning to the misty veil that enshrouds the future, we shall see a giant spectre slowly defining its shadowy form against the western heavens."—*Pompelly, Ch. 19, p. 247, 3d ed.*

OFFICE STATE BOARD OF HEALTH,  
Sacramento, March 1st, 1871. }

*Arthur B. Stout, M. D. :*

DEAR SIR : KNOWING the interest you take in every subject involving the philosophy of medicine, connected as it is, on the one hand, with science, and on the other with the endless cares, the wants and sufferings of humanity—and remembering the startling sounds of the tocsin you were the first to sound, some eight years ago, on "Chinese immigration, and the physiological causes of the decay of nations"—I take the liberty of addressing myself to you, in my official capacity, at this juncture of the Chinese-American question. It is not yet generally known, and therefore may be new to you, what I have already stated on taking the initiative, that the last Legislature, with the broadest statesmanship, and regarding the personal and individual strength and availability of each and every member of the body politic—"the bone and muscle that create, and the mind and spirit that control, direct and enjoy all earthly possessions"—as the essential element of the State, to be cared for as well as more material interests, has instituted and appointed a Medical Tribunal, or Board of State Medicine, for counsel and guidance in cases where the lives and health of the people are concerned. As the executive of that tribunal, I am endeavoring to enlist the aid of the medical men disseminated throughout the State—who are the proper censors of the public health—in the cause of sanitary science and the promulgation of hygiene. Occupying, as they do, to use your own language, a high and influential position, their counsels and their teachings are all-powerful in contributing to improve the health, the strength, the vigor, both physical and intellectual, of the people. It is with this understanding I propose to invoke your services, for the good of the State, in the discussion of the momentous question before us. It is true, you have already consulted the writings and cited the opinions of the learned and scientific, and from this vast research have drawn certain conclusions and defined certain laws, which ages will never be able to controvert; but, as the world moves rapidly now-a-days, so there are new agencies springing into existence, and changes occurring in the civil status of the ~~Mongolians~~ <sup>Chinese</sup>, which may prompt you to reconsider what you have already ~~concluded~~ <sup>concluded</sup>, and qualify your inferences.

The opening up by steamships of a constant communication between the Pacific ports and China, is flooding the country with hordes of pagans, who, by virtue of the triumph of republican principles, after a civil war of four years' duration, waged to break down the stratification of society, are, or soon will be, absolutely our equals before the law. Public opinion, swayed more or less by selfish considerations, is now severely exercised on this, the living question of the hour, which, if wrongly settled at this time, will be a disturbing power forever; while, with the history of the Spanish-American provinces before our eyes, degeneration must certainly pursue its course, in personal and individual antipathies finding its only check. I apprehend, however, that I am advancing upon ground covering questions the most difficult and complicated that can be found in the whole range of science, of philosophy, of political economy or of morals—questions that would, perhaps, require more time and research than you may be able to bestow. Although, to one whose mind is so constituted as yours—never content with the mere practical part of your profession, but confessedly fond of wandering back into the æsthetic realms of archæology and ethnology—whatever concerns the history of a nation whose antiquity can be traced back, by a direct and connected series of events, almost to the creation of the world; whose vast extent of territory and resources, whose magnificent monuments, whose literature and arts, government and immense population (estimated at three hundred and fifty millions), cannot but constitute objects of exceeding great interest. Still, passing by all these considerations, I desire more particularly that you should investigate the evils likely to result from combined influences of the intermixture of races and the introduction of the habits and customs of a sensual and depraved people in our midst. Coming, as they do, of all classes and conditions imaginable, with their hereditary vices and engrafted peculiarities, crowding our seaports and spreading through our inland towns and villages, they must become liable, like our Indian aborigines, to maladies consequent upon so great a change of climate, food and general circumstances. Look, besides, at some of the occasions and predisposing causes of disease existing in our more populous communities—narrow and filthy lanes, low-built, miserably-ventilated houses, small and crowded apartments, into some of which the light of day never enters; damp walls and floors, and uncleanness of personal habits, together with insufficiency of pure water and of fresh, sound animal and vegetable food—these are the general conditions and surroundings of their miserable existence. In view of such inducements to disease and enemies to health, it is a matter of astonishment that a relentless pestilence does not arise every year, and with the fatal malignity of the late epidemic, small-pox, spread dismay and desolation throughout all our land. Especially would I direct your attention to the habitual use of *opium*, which may be more readily communicated than, I am sorry to say, the practice of eating it already is, to our excitable community—it seeming to hold out a temptation far more powerful than that of any other intoxicating substance. The practice of *eating* opium, as you well know, has prevailed for more than a century in Persia and Turkey; but that of *smoking* it, to which I specially take exception, originated at a much later period, and has been confined mostly to China and its adjacent provinces. The manner of smoking opium differs materially from that of tobacco. The process consists in taking very long whiffs, thereby expanding the lungs to their utmost capacity, and communicating the influence of the smoke to all the air cells, and at the same time retaining it there as long as possible. This explains, in a

great degree, the almost instantaneous and powerful effect upon the whole system. When taken into the stomach, the influence is communicated from the sentient nerves of this organ to the cerebro-spinal system, and thence to the whole animal economy, by absorption into the blood through the veins by lymphatics. But, when inhaled into the lungs, it comes into direct contact with a far more extended and highly organized tissue, and not only enters the circulation more or less by absorption, but, by its inherent nature, contracts the air cells of the lungs in such a manner as to prevent the blood from receiving its due proportion of oxygen. This deficiency of oxygenation of the blood must exercise a most deleterious influence.

These and other facts connected with the demoralizing and depraving habits charged against this people, must be brought fairly to the test. The lights of science challenge such a scrutiny; the interests of a progressive civilization demand it. If our Government has rashly committed itself to the flowery sentimentalism of the Burlingame Chinese treaty, surely Congress could have appointed, in the exercise of its high prerogative (as any other deliberative body—the English Parliament, for instance—would have done in a similar emergency), a Commission of Inquiry, to investigate and, if necessary, report on some means for regulating the evil we have brought upon ourselves. Failing to do this, it remains for California, exposed and threatened as she is, at the very dawn of her political existence, to avert, as far as lies within her power, some of the consequences of an unwise treaty. Laws should follow in the wake of science, modified and adapted to the advancing knowledge of the day.

At this stage of the case, I see, therefore, no more reason why you should not go over the same ground you have already travelled, and reopen the same issues you have already so logically met, than that we should be content to abide by the dogmas of religion adapted to a by-gone age, without again and again searching the Scriptures for ourselves from an enlarged point of view, corresponding to the spirit of the times. Line upon line, day after day, must the holy words of wisdom be pondered, if we would rightly interpret their full significance; and so it seems to be the order of Providence in every phase of humanity, that great truths shall be disclosed gradually, and at different periods of the world's history. Should you, however, after weighing all these considerations in your own mind, determine not to accede to my request, and deem it inexpedient to renew your observations and bring them down to the level of the ever-expanding horizon of knowledge, then may I ask to be permitted to incorporate in my report to the next Legislature the statesmanlike arguments you have already advanced, and which have been too little read, and, I fear, already forgotten.

With great regard, I remain yours truly,

THOS. M. LOGAN, M. D.,  
Permanent Secretary State Board of Health.

SAN FRANCISCO, May 20th, 1871.

*Dr. Thos. M. Logan, Permanent Secretary California State Board of Health :*

DEAR SIR: In accepting your invitation to give you my views on the question of Chinese, or, more properly, Mongolian immigration into the United States of America, and into California especially, I prefer to engross your own sentiments with my own, as they appear in your letter to me, rather than simply to rehearse, as is usual, the particulars of your highly complimentary request. I therefore insert your entire letter in my reply.

Furthermore, sir, as a full review of this highly important subject in the future political economy of the country appears desirable, after ten or fifteen years of experience of its effects upon public opinion, I desire also to incorporate in this review the whole of my essay, published in eighteen hundred and sixty-two, "on Chinese immigration and the physiological causes of the decay of a nation :"

## IMPURITY OF RACE, AS A CAUSE OF DECAY.

### PART I.

The medical men disseminated through a State are proper censors of the public health. It is their high province not only to cure disease, but to study and to promulgate the principles of hygiene. In preventing the invasion of disease, they fulfil a more lofty, because more disinterested function, than in eradicating maladies already engendered. Occupying a high and influential position, their counsels and their teachings are all-powerful in contributing to improve the health, the strength, the vigor, both physical and intellectual, and also the endurance among nations, of their race. It is in this view that I propose to examine the various causes which combine to deteriorate the American people.

I may at once state, in acknowledging my indebtedness, and in offering my humble tribute of gratitude to the high authorities whence I have drawn information, that I have freely consulted and drawn from the works of —

Brasseur de Bourbourg, *Histoire des Nations Civilisées du Mexique et de l'Amérique Centrale durant les Siècles Antérieurs à Christophe Colomb.*

Types of Mankind, Nott and Gliddon.

Volney, *Ruines des Empires.*

L'Abbé Huc, *Journey Through China.*

Morel, *Dégénérescence de l'espèce humaine* : Paris, 1857.

Combe, on the *Constitution of Man.*

Michelet, *La Femme* : 1860.

Davis' *History of the Chinese.*

Martin's *History of China.*

Gutzlaff's *History of China.*

The comprehensive work of Nott and Gliddon, replete with research, contains ample citations from Morton, Humboldt, Agassiz, and all the great authors upon the subject.

Sanger, *History of Prostitution* : 1859.

Claiming nothing original, but that the knowledge of science when once published is the property of mankind, I hope by adducing these high authorities to obtain more appreciation of my views than if presented on my own unaided responsibility. If the State of California can receive benefit from medical research, it is chiefly by drawing attention to the discoveries of modern science in the matters I shall treat of, and at the earliest moment in its history engrafting them upon her institutions.

Over the world is fast extending what is termed the great Caucasian race of men. Children of migration, they move in vast waves over every continent. From the cradle to the grave they fluctuate in alternate ebb and flow over every region of Europe, vast tracts of Asia, the north and south of Africa, nearly all of North America, and are fast encroaching upon the South American continent. This is the race created with the highest endowments, and greatest aptitude under various circumstances, to encounter the vicissitudes of every clime and every soil. God speed it on its way!

One great division of this race, the Anglo-Saxon, is now occupying America, and the type thence arising is the one in which I am at present interested. The history of the rise and fall of empires sufficiently attests the migratory nature of the parent stock; and the American offspring appears abundantly imbued with the hereditary spirit.

In history, the brilliant details of wars and victories dazzle the sight and engross the mind. The student of history, in witnessing the origin, the glory and the demise of a nation, is apt to attribute to these wars and their political sources the catastrophe which he mourns. In searching among the ruins of the past to discover a guiding principle for the future, it is to these causes that he looks for his material.

But, in truth, a deeper cause, of which these wars and world-spread dissensions are only the effect, lies at the root of the evil. This cause, the abuse of the human system, insidiously gnaws into each individual body, undermines the strength and beauty of God's noblest work, and thence penetrates, cancer-like, into the social, religious and political system. Thus contaminated, all the systems, in fatally allied conspiracy, attack the solidarity of the nation.

The originally predominant purity of the animal economy and of the intellectual government offer a short-lived resistance. Internal dissension, fostered by a consequently invited aggression, exhausts the power of the race, and a nation, vanquished by itself, sinks into oblivion.

The action of the brain guides both the physical movements and the intellectual emanations. From the blood the brain derives its nutriment. If the aliment be rendered impure, the cerebral mechanism receives a corresponding alteration. As the blood degenerates so will the race of men; and a degenerate nation can neither dictate to nor survive one of higher physical and intellectual endowment.

To the Caucasian race, with its varied types, has been assigned the supremacy in elevation of mind and beauty of form over all mankind. High over the rest it surveys the field of life. Appointed by the Creator to wield all human destinies, He has endowed it with the power, above all others, to study, to admire and rule such of his Almighty works as enter within the sphere of man. No new combination of distinct existing races can improve this Divine excellence. Whatever enters it, tends to destroy it. In proportion to the rapidity with which deleterious elements are introduced, must be the ratio in the course of time of its degeneration and final extinction.

Our new American embranchment stands now isolated among nations in its purity and highest degree of cultivation and refinement, proudly rivalling them all. Yet, from the nature of its social and political institutions, more than all of them subject and exposed to a fearful pressure from without, it hence tends to destructive amalgamations and the ruinous influences of conflicting political systems. These conditions are magnified by the mercenary efforts of self-interest, by the abuse of a morbid philanthropy in liberal government, and by belief in the general equality of mankind.

The time to urge and impress the mind with the necessity of preserving the purity of race, is while the race is new, and thus close the door to amalgamations while the stock is pure and young. To permit the ingress of an inferior race is to strike at self-destruction. A government, to protect its people, should strive to preserve the purity of the race; and, irrespective of political theories, should guard it from every amalgamation with inferior types.

No State of our Union is so exposed and threatened as California. At the very dawn of its existence it is menaced with the introduction of these pernicious elements; and if now the struggle for life be not commenced, it must forever be abandoned. The degeneration will pursue its course, in personal and individual antipathies finding its only check.

I am led to these reflections from the contest now waging in regard to the Chinese immigration. It is stated that the Supreme Court has decided that the legislative statute preventive of this immigration is unconstitutional. But little versed in legal lore, I dare not oppose the wisdom of the Court in its constitutional decision. But, in a physiological view, the argument may yet be open. The first law of nature is to preserve the purity of the race—provided the race be of all others the superior. Self-preservation claims the first protective enactment. If the world mourns the presence of a negro race in the Eastern and Southern States, what tears may be shed when, in the course of ages, the great west is overwhelmed with a Chinese immigration. Once permitted, it must be forever endured. The work of degeneration once commenced, its progress must pursue its insidious and empoisoning influence, not for a few years, but centuries to come. The legislation now enacted is less for our own than for generations which, in the future, by their purity shall bless, or in their degeneration shall curse, their ancestral stock.

Among the causes I have yet to enumerate, which together combine to exhaust and degrade a race, the intermixture of blood with inferior races is the most potent and the most deplorable. All the arguments of the advantages of commerce and the toleration of liberal government sink into insignificance in comparison with the primary law of nature, which teaches self-preservation in protecting the purity of type in the race and perpetuating the endurance of the nation. When we contemplate the ruins of empires, we read the neglect of these laws.

By the adoption of bad blood we voluntarily introduce the deadliest foe to our existence. If we but exclude this internal enemy, no outward force can crush our nation. It is in the healthful consolidation of all the means which invigorate the mental and physical energies, and the exclusion of all the constitutional destructive influences, that the highest type of mankind, all radiant with its manifold beauties, can be attained. All liberal laws are made special to the race which adopts them. There is no oppression in excluding inferior races from their enjoyment. By intermarrying with Europeans, we are but reproducing our own Caucasian type; by commingling with the eastern Asiatics, we are creating



degenerat●hybrids. We may seek to exchange commodities, but never to blend races. The argument that justice demands, while we are claiming free admission and intercourse with China, that we should freely open to the Chinese our portals and adopt them as our own, is not founded in nature. The Chinese may gladly court an American emigration to their land, for every combination improves and exalts their enervated race; while, on the contrary, every permanent settlement of a Chinaman on our soil creates a depreciation in the blood of our own. "Commercial alliances, if you will, with all the nations upon the earth, but political alliances and social entanglements with none of them."

In thus refusing to the eastern Asiatics the privilege of free immigration and permanent domicile in the land, I would not be thought to deny to an ancient and once enlightened race the merit due to their intelligence. Only it is vain for man to seek to unite that which the Creator has so distinctly divided. The Divine will has imbued every race with excellent qualities, but has shown, in the distinctions established in accordance with topography, climate and physiological development, that they were not created to be indifferently blended.

In singular opposition to the freedom of admission to the Chinese, or "Indians," granted by the decision of the Supreme Court, stands their exclusion, by statute, from the privilege of giving testimony in Court against one of the Caucasian race. This almost denies them the rights of human beings; denies them the faculty to see, to hear, to tell the truth; and with an arrogance truly worthy of a "bamboo despotism," assumes a superiority far beyond the physiological differences of race which the Creator has designed. In Austria, a nobleman cannot be tried in a plebeian Court. Our democratic country goes still further, and denies to both pure races, as well as hybrid modifications, the right to peril the life or property of a Caucasian. The law of the State declares the following persons shall not be witnesses:

"Indians, or persons having one-fourth or more of Indian blood. Negroes, or persons having one-half or more negro blood."

In eighteen hundred and fifty-four, Judges Murray and Heydenfeldt, in rendering a judgment—*The People vs. Hall*—state as follows:

"From that time [the landing of Columbus in America] the American Indians and the Mongolian or Asiatic were regarded as the same type of the human species."

"At the period whence the legislation dates, those portions of Asia which include India proper, the Eastern Archipelago, and the countries washed by the Chinese waters, were denominated the Indies, from which the inhabitants had derived the generic name of Indians."

"Ethnology at that time was unknown as a distinct science, or, if known, had not reached that high point of perfection which it has since attained by the scientific inquiries and discoveries of the master minds of the last half century. Few speculations had been made with regard to the moral or physical differences between the different races of mankind."

The learned Judges then, with much apparent reluctance, admit and say: "Although the discoveries of eminent archæologists and the researches of modern geologists have given to this continent an antiquity thousands of years anterior to the evidence of man's existence, and

the light of modern science may have shown conclusively that it was *not* peopled by the inhabitants of Asia, but that the aborigines are a distinct type, and as such claim a distinct origin—still, this would not alter the meaning of the term (Indian), and render that specific which was before generic."

We have, then, two races of Indians—the Asiatic, or Mongolian, and the American Indian, the aborigines of the continent. The American aborigines are only termed Indians because the original discoverers of America supposed they had reached the Indies by a western route when they arrived at the West India Islands. Both are pure blood races, and both possess their peculiar and eminent qualities. Although experience proves they cannot blend as races with the Caucasian, without detriment to the last race, yet it has never shown that they are unworthy of respect and honor in their rank among nations.

Who can regard the magnificent monuments of China, the excellence of her arts, the extent of her productions, and the refinement of her parental government before the Tartar dynasty, and say a Chinaman dare not open his lips in testimony for or against a white man? Who can contemplate the vast ruins of Central America, whose splendor still defies the wreck of time, the mounds of the United States, the traces everywhere of former power and thought, and refuse to the aboriginal of America, fallen as he may be, the right to confront the aggressive Caucasian in the cause of justice? We may hold the negro our slave, but as nature has created him with sufficient qualities to render him of value, even as a slave, he should still be allowed to see, to hear, and tell the truth. The mixed races, in their turn, should have their testimony taken at its value; but yet, though freely associated with at one moment, they are turned out of Court the next. Thus, in supercilious pride, the white lord disdains the laws of nature, and, while he too often converts them to his purposes, subverts the natural claims of God's creatures. These are the tyrannies which in time combine to overthrow his empire. If individual worthlessness cancel the value of a testimony, let it be rejected as individual, but deny not to races their innate prerogatives. The same law which would restore their natural right would guard against its abuse. False testimony may be given in either case; we avoid its liability by statutory provisions. A radical principle should not be denied because errors of fact may endanger its application.

In ages far remote, when the historian shall search the records of the past, it will be in the laws of the State, as its best and most authentic monuments, that he will estimate the degree of civilization to which the people had attained. Laws, then, should immediately follow in the wake of science. They should be modified with the progressive knowledge of the day. We contend these laws are not the index of the age, nor do they express our degree of civilization. They may have suited the era of Columbus, but science in ethnology, geology and archæology has doomed to forgetfulness those old ideas.

A broadcast view over the country will show the progress of deterioration by the blending of races, as it insidiously but slowly advances.

To illustrate the ramifications which result from the fusion of three races—the Caucasian, the aboriginal American and the negro—I take the arrangement of Tschudi, and adopted by Nott and Gliddon:

Parents.	Children.
White father and negro mother.....	Mulatto.
White father and Indian mother.....	Mestiza.
Indian father and negro mother.....	Chino.
White father and mulatto mother.....	Cuarteron.
White father and Mestiza mother.....	Creole, pale brownish complexion.
White father and Chino mother.....	Chino-blanco.
White father and Cuarterona mother.....	Quintero.
White father and Quintera mother.....	White.
Negro father and Indian mother.....	Zambo.
Negro father and mulatto mother.....	Zambo-negro.
Negro father and Mestiza mother.....	Mulatto-oscuro.
Negro father and Chino mother.....	Zambo-chino.
Negro father and Zamba mother.....	Zambo-negro, perfectly black.
Negro father and Quintera mother.....	Mulatto, rather dark.
Indian father and mulatto mother.....	Chino-oscuro.
Indian father and Mestiza mother.....	Mestizo-claro, frequently very beautiful.
Indian father and Chino mother.....	Chino-chola.
Indian father and Zamba mother.....	Zambo-claro.
Indian father and Chino-chola mother.....	Indian, with frizzly hair.
Indian father and Quintera mother.....	Mestizo, rather brown.
Mulatto father and Zamba mother.....	Zambo, a miserable race.
Mulatto father and Mestiza mother.....	Chino, rather clear complexion.
Mulatto father and Chino mother.....	Chino, rather dark.

Here, then, are twenty-three varieties, or crosses, occupying our soil with their progeny, and multiplying their kind, to the continual detriment of the Caucasian race. "To define their characteristics correctly," adds the learned German, "would be impossible, for their minds partake of the mixture of their blood. As a general rule, it may be fairly said that they unite in themselves all the faults, without any of the virtues, of their progenitors. As men, they are generally inferior to the pure races, and as members of society, they are the worst class of citizens."

On some of these mixtures the author is doubtless too severe, for several of them possess commendable qualities, but are always far inferior to the pure white race. It will be seen that Tschudi gives the scientific definition of the term Creole. This does not regard the signification indulgently given to the term in some of the Southern States, where it is simply applied to the native offspring of foreign parents, even when the parentage is pure white. The author studied these amalgamations in Peru; but in the United States, where more benign institutions exist, their better qualities being elicited and their vices repressed, they appear in a more favorable aspect. These combinations, to the number of many millions, are now engrafting themselves, with their injurious tendencies, upon our race. Their increase is immense. However impossible or inexpedient it may be to disturb them, is a question of national policy, as "better to bear the ills we have than fly to those we know not of." Still, in the progress of ages, the pernicious element cannot fail to augment, and greatly to the detriment of the pure and superior race.

Let us now, in imagination, pass over a space of two hundred years, and observe the country when, in addition to the American Indian and negro amalgamation, the Asiatic Indian shall have had free scope; when in that time, which for nationalities is short, the Chinese, Japanese, Malays and Mongolians of every caste, shall have overrun the land; when they, in their turn, have given origin to their countless varieties of hybrid creatures. As the locusts of California overrun the fields of the husbandman, will these swarms of beings degenerate our land. In

the progress of this debasing alloy, and in the course of time, may another Volney follow his guiding genius from "those ramparts of Ninevah, those walls of Babylon, those palaces of Persepolis, those temples of Balbec and of Jerusalem," and after dwelling a time in mournful meditation over those yet more ancient forest-covered ruins of Mexico and Central America, come to pour out his last lamentations on the crumbling remains of our own Republic.

### *The Remedy.*

What is the remedy for this vast evil? Early prevention is the only specific. Plant not the germs, and there will be naught to eradicate. While the Chinese immigration is controlled by a few leading men, heads of societies or Hong merchants, its restriction may be easily accomplished. The correction must commence at its source. Better would it be for our country that the hordes of Genghis Khan should overflow the land, and with armed hostility devastate our valleys with the sabre and the firebrand, than that these more pernicious hosts, in the garb of friends, should insidiously poison the well-springs of life, and, spreading far and wide, gradually undermine and corrode the vitals of our strength and prosperity. In the former instance, we might oppose the invasion with sword and rifled cannon; but this destructive intrusion enters by invisible approaches—is aided and fostered in its advance by those who forget or never dream of their country's interest, while they seek to advance their private ends.

When the engrafting is thus perfected, eradication becomes impossible. Let the Attilas of Asiatic despotism appear, and every freeman will prove to be a Meroveg; but against a coolie who can struggle? What though the labor of coolies be cheaper than that of the stalwart men of our own race—we must, nevertheless, lose by the exchange. If the former drive back these hardy pioneers, who shall defend the land? Who shall whiten the plains with their homesteads? Who shall form the families of the Republic? The vigorous strength of Caucasian labor cannot be nourished with a handful of rice; nor will their intelligence, for their own emolument, or their aspirations for their children, accept existence in a state of protracted coolieism or serfdom. Reduce their wages to the rates of coolieism, and you degrade them, physically and morally, to the state of coolies.

Our native and adopted people require the higher rates of wages, for they have higher functions than mere daily labor to perform. They are the volunteers in the promotion and the defence of the rights of man. To them we look for the maintenance of the Union and the progress of civilization. If, by inadequate recompense for their labor, we banish them eastward from our frontier, and adopt the Chinese immigrant in their stead, who will repel the foreign aggressor whom war shall invite to our shore? What part in the fierce drama of national defence will the coolie play? Why, exactly the part of the crow in an unguarded cornfield—to seize the grain and fly at the first sign of gunpowder.

The preventive remedies are—

I. The action of the General Government to reform our treaty stipulations with the Empire of the East.

II. The intervention of the Legislature of the State to enact such laws as shall be radical in preventing immigration.

III. The encouragement of local associations to elevate every possible barrier to its progress.

IV. The cultivation of a public opinion which shall be all powerful to discountenance the employment of Chinese labor.

It is not my province to enter into the details of these four classes of remedial agents. I leave them to the more competent authorities in their respective departments, and respectfully invite all to co-operate therein, from the Executive at Washington to the humblest operative whose voice speaks by a ballot.

It is appropriate to ask, what is the position which the Asiatic stranger should receive in the State? What national view should be taken of his desire to visit the country? In what aspect should he appear to every generous citizen? The just reply would be, he should be regarded as a guest in a foreign land. "Stranger is a holy name." The munificent host should extend to him his cheerful and enriching hospitality. It may not always be requited here, but our adventurers on Asiatic soil may receive the reward. With the extension of commerce and the increase of associations which thence arise with this remarkable nation, the fairest facilities for the agents of both parties, and respectively in each other's country, should be encouraged. My arguments against extended immigration, permanent residence or adoption as freeholders are entirely distinct from these commercial considerations.

I do not seek to embarrass trade, but I do desire to prohibit immigration as a national measure to obtain population; to dispose of public or private lands; to acquire cheap labor, or to consult the convenience of reckless speculators. Let us receive the Chinaman, whether mandarin or coolie, with a respect due to his ancient grandeur, his still existing power and ability. Let us refuse him permanent domicile, elective rights, title in fee to land, declare null by statute intermarriage, and compel the ultimate return of every trader to his native land. With a constantly increasing commerce, his total expulsion is impracticable. Let us, therefore, receive him as a transient resident, teach him our language, inspire him with regard for our religion, instruct him in the principles of our sciences, initiate him into the details of all our practical arts, display to him our improved engines, manufacturing machinery, improved implements of trade, and our economical modes of labor-saving husbandry.

Let us imbue him with a love of all the refinements of our social system, and a desire to adopt the extended comforts of our mode of living. Let Chinamen thus accomplished return to their native homes, and diffuse, broadcast, the instruction thus acquired.

These are the influences which convert a nations. This is practical Christianity; this is the means to protect the purity of our own race, and elevate the other to the highest degree of attainable civilization. The history of China gives the most convincing testimony that the Chinese people, in earlier ages, received with welcome, and were exceedingly disposed universally to adopt the Christian religion. Its missionaries, pious, fervent and devoted as individuals, were honored for their scientific attainments. Their knowledge in mathematics and astronomy promoted them to the highest places of preferment.

Emperors themselves were softened by their influence and yielded to their persuasion. Their Christian doctrine received a wide extension, and Christian altars arose among heathen temples. But it soon appeared that to accept the Christian worship it would be necessary

to submit to Roman rule. The adoption of Christian rites involved the disintegration of political structures. To save the empire they must reject the new religion. The snow-white robes of the Church concealed in their folds the keys of empire and an iron sceptre. To escape the latter they rejected the whole. As they had surrounded themselves with a material wall to exclude the inimical Tartars, so they enveloped themselves in political exclusion to evade revolutionizing doctrine. Christianity was not offered to them as a Heaven-sent boon, without a price. Its intrinsic worth and beauty was to cost empire and independence; to be harvested in subjection and be mulcted by tyranny.

The Christianity we offer is for its own enlightenment. We ask no sway; we seek no territory. The seeds we plant offer their tenfold harvest for the benefit alone of the nation which reaps.

The anti-Christian religions of Asia should constitute an insurmountable bar to the free admission of Asiatics on this continent. While but few are here, the occasional appearance of an idol temple may not be of consequence; but when, ere long, the immigration, if not prevented, will be immense, these people will claim permission to worship according to their Oriental doctrine.

In every valley and over every plain Christian churches and heathen temples, side by side, will offer their grotesque contrast to the sight. It may be safely questioned whether, in admitting into our Constitution the free toleration of all religions, the framers of our magna charta had any other than Christian doctrines in their view. Their attention was engrossed with the European systems and the controversies from which they had just escaped. Had they foreseen the extension of territory which their young republic was destined to acquire, and the close intercourse with the Asiatic world which would ensue, they would have confined within Christian limits such universal toleration.

The population of China exceeds three hundred millions of inhabitants. The territory they occupy is scarcely large enough to contain them. Although the aggregate amount of their labor is immense, the great majority of them can only obtain a scanty subsistence by the most patient and incessant industry. Extreme poverty universally prevails, and a recompense inconceivably small is the reward of their toil. Hundreds of thousands of these impoverished beings would gladly escape to other realms if the opportunity was offered them to improve their condition. The overflow from their native land to this country, if no restriction withheld them, would be immense; and the Vanderbilts of commerce would even now have covered the seas with their fleets if no barrier intervened to prevent their transportation to our State. We owe to their own laws and to the peculiar tenets of their religion our immunity from this inundation. The very limited number of Chinese which, under special contracts, are permitted to emigrate, are compelled by law to return within a specified time, or, in case of death, the rites of their religion require that their remains be restored for interment in their ancestral graveyards.

Thus are we indebted to foreign laws, and not to our own precautions, for the salvation of the country.

Let but these barriers burst and we have no protection from the hosts which will flow across the Pacific. That these barriers will burst is the manifest destiny of the Chinese nation. The most casual observer must easily discern that the entire social, religious and political reorganiza-

tion is in progress throughout the whole of Asia. This metamorphosis is her infallible destiny. If Asia is to participate in the refinements of civilization and the progress of human culture throughout the world, she must accede to and adopt this radical revolution. With or without her consent this destiny will be accomplished. Time is the only question. The encroachments of English power from the west, the gradual but certain approaches of Russia from the north, the allied fleets of England and France which hover along and seek admission by her eastern shores, must eventually overwhelm the Asiatic continent. India crushed by the grasping hand of trade, the Hindoos brutalized in their idolatry, and China torn by rebellion, poisoned with opium and starving in poverty, must fall together in one general ruin. Railroads and canals will penetrate the deserts, the lightning telegrams will shortly flash through the Russian Empire of the North, and the navies armed with all the batteries of modern invention which invest the continent, all concentrate their intellectual and physical resources against the numerous but defenceless nations of Asia. If England and France, for their own aggrandizement, arrested for awhile the encroaching power of the Czar at Sebastopol, they gave to Oriental exclusiveness its death-blow at Peking. The former act can have but limited effect, but the second will be forever permanent.

Thus do all civilized nations, while advancing their varied interests, combine to destroy the ancient religions and idolatries of Asia, and regenerate its exhausted races. Islamism and paganism must alike sink into oblivion, and Christianity enter, like sunlight into chaos, to illuminate and revivify this ancient world. Be it so; and when this destiny shall be accomplished will be the moment to review our national policy, repeal preventive laws and admit Asiatics to the privileges of freemen.

## PART II.

I have now to consider other causes which, singly or in combination, when acting upon the human system, impede its normal development or undermine and enervate its beauty and strength. Of these are, first, hereditary diseases, as phthisis or consumption, scrofula, syphilis, mental alienation and epidemic diseases; secondly, material agents deleterious to the human economy. The first class acts in a double manner on the individuals themselves subject to the maladies, and secondarily on their progeny. The second class, comprising active material agents used to excess, contains all the stimulant as well as narcotic agents resorted to by man to exalt his enjoyments or appease his miseries. They are opium, tobacco, fermented liquors, and all stimulo-narcotic agents more or less in common use as luxuries of life.

It will readily be perceived that each one of these causes is worthy of a monograph; but the present occasion compels me to group them, and sweep over the field with hasty speed.

Could I in one terse page exhibit all the miseries, all the degradation, all the ruin which the abuse of these agents has, in the great revolution of time, accumulated upon the human races, not all the famed artists of the past, nor the ambitious aspirants to future greatness, would suffice to portray the dreadful picture. Could I annihilate them, the arsenal of death would be well nigh exhausted.

As the maladies indicated in the first class are in many cases only the effect of the agents enumerated in the second class, the above arrangement is not arbitrary, but for convenience alone.

*Phthisis and Scrofula.*

Phthisis or consumption, and scrofula, are, of all others, the most destructive maladies of our country. To expatiate upon their insidious invasion, enumerate their manifold manifestations, describe the fear and anxiety which invests their suspected existence, or enter into their minute pathology, is foreign to my subject. To evoke their causes and indicate the mode to evade their intrusion upon the animal economy, is a matter of public hygiene. The individual who once so lives as to engender in his system the germ of these diseases, commits an enduring wrong upon his lineal successors. These diseases, in their chronic or hereditary condition, are diseases of debility, and entail upon the families they invade a successively enfeebling progeny. For the climatic influences which lay their foundation, men can scarcely be responsible, except in the careless neglect of the sanitary measures which protect the system from changes of weather. But other causes combine to give them origin. These are the gradual but long continued introduction into the economy of agents which for a time stimulate, yet ultimately enervate its powers and radically alter the constituents of the animal tissues.

When a rich, healthful, normal blood no longer permeates the blood vessels, distributing to the various tissues their quota of natural components, and when the brain no longer daily receives its adequate allowance of pure blood, its reflex influences upon the tissues are correspondingly altered and necessarily vitiated. Degeneration, with its series of hereditary contaminations of the pure type, commences. Thence may be traced the origin, in numerous instances, of miliary tubercles, whether of the lungs, brain or bones, and the enervation of scrofulosis.

*Syphilis.*

Who can calculate the innumerable losses to society and its population which result from neglected syphilis? Its deeply engrafted poison follows in the race to every generation, except in those instances where its immediate or hereditary presence produces sterility, and then the State loses a family.

How often are the best directed efforts of science, in curing uterine maladies and restoring fertility, rendered ineffectual! The latent virus has stricken its victim, and too often, even when suspected or detected, refuses to relax its grasp. The influence of this malady upon the uterus is either entirely to arrest development, to degenerate its product, or to produce the actual death of the ovum. Fortunate for society, except in a numerical point of view, when the arrest of development or the death of the progeny occurs—for its elaboration is always defective, and a race of a lower type produced.

*Mental Alienation.*

I must touch for a moment the vast subject of mental alienation. When the empire of the brain over the economy is once profoundly injured and subverted, all that long train of heart-rending diseases which fill the asylums devoted to insanity is founded. The perverted mind and distorted body are together the dreadful signs of the degradation which ensues from the abuse of the laws of nature, and excess in the use of the agents given to man for enjoyment and the perpetuation of his



fect race. This subject opens to view the great national question of alcoholic intoxication, or the empoisonment of the system by the abuse of fermented liquors. Its exponents fill our hospitals, almshouses, orphan asylums, lunatic asylums and prisons. Without attempting to advert to all the maladies which arise from this cause, or dilate upon idiocy, mania, epilepsy, delirium tremens, softening of the brain, hereditary mania, atrophy of general form and strength, paralysis and general depravation, both moral and physical, of the system, I shall draw upon Morel for a picture of the condition of Sweden, and ask every reader, from the deplorable condition of another country, to draw the natural deduction for our own, and from their fate learn our own salvation :

“There are annually manufactured in Sweden, on the most moderate calculation, two million litres of brandy of the country. But very little of this is exported. Sweden contains three million inhabitants. By deducting from this number the children, a large number of women and persons whose local position forces them to moderation, one million five hundred thousand inhabitants remain who annually consume each from eighty to one hundred litres of brandy. It is easy to perceive the progressive decay in those families in which the alcoholic degeneration has controlled the mass of the hereditary phenomena.”

“It is an indisputable fact,” says Huss, a scientific Swede, “that the Swedish people in their stature and their physical force have degenerated from their ancestry.” Translating again from Morel, he states that “it is certain that the constitution of the Swedes has undergone considerable pathological modifications. It is vain to seek in the country those men of the north so boasted of by historians and poets.” Special maladies, as chronic gastritis and scrofula, have, in frightful extension, become general. An affection, formerly unknown—chlorosis—has invaded all classes, as well rich as poor, and rages both through the country and in the cities. •

Into this state of health, the details of which I omit, other causes may indeed enter; but alcoholism, with its persistent but degenerating erythsm, enters for a very large proportion. No person of experience will deny the indispensable necessity of the use of fermented liquors under circumstances of unusual fatigue of mind or body, nor their importance as a remedial agent in adynamic diseases. Their moderate use to enhance the enjoyments of the festal hour, has been admitted for all time. It is their steady, persistent abuse, until the blood has become vitiated—until the brain no longer performs its normal functions—until the constituent solid tissues of the body are involved in the disease, and the mental erythsm of alcohol combines with corresponding enervation of body to destroy the healthy structure, impoverish the body and degenerate the progeny, that they are to be inveighed against as poisons. It is then they create their hereditary maladies; it is then the vice of the parent is perpetuated in the offspring, ruins the family and degenerates the nation. Who has not seen in the features of the child the altered likeness of the inebriate father? To illustrate these varied conditions, the plates of Morel will serve better than elaborate phrases, and to them I refer the reader. Thus it is that the sins of the parents are visited on their children “unto the third and fourth generations.”

*Tobacco.*

The consumption of tobacco is increasing annually to an enormous amount. In intensity of action upon the system, it excels the different stimulo-narcotic agents used in other countries. It surpasses hasheesh and opium in activity, if taken internally, and stands prominent as a deleterious agent, when abused, to the vigor and health of the economy. If our Government require funds for war, let taxation fall heaviest on these articles; then, at least, may the consumer, while he ruins himself, enrich the nation. It would be interesting to trace its enervating influence in its varied symptoms, but a recapitulation of the deleterious effects of all this class of substances may be found in the consequences of the abuse of opium, as narrated by authors who have studied it among a people addicted to its excessive abuse.

*Opium.*

The Abbé Huc states, that "at present China purchases opium annually of the English to the amount of thirty-five million pounds sterling. Large, fine vessels, armed like ships of war, serve as depots to the English merchants. These rich speculators live habitually in the midst of gaiety and splendor, and think little of the frightful consequences of their detestable traffic. When from their superb palace-like mansions on the seashore they see their beautiful vessels returning from the Indies, gliding majestically over the waves and entering, with all sails spread, into the port, they do not reflect that the cargoes borne in these superb clippers are bringing ruin and desolation to numbers of families. With the exception of some rare smokers, who, thanks to a quite exceptional organization! are able to restrain themselves within the bounds of moderation, all others advance rapidly toward death, after having passed through the successive stages of idleness, debauchery, poverty, the ruin of their physical strength and the complete prostration of their intellectual and moral faculties. Nothing can stop a smoker who has made much progress in this habit; incapable of attending to any kind of business, insensible to every event, the most hideous poverty and the sight of a family plunged into despair and misery cannot rouse him to the smallest exertion, so complete is the disgusting apathy in which he is sunk."

The use of opium, to an abuse, and as a deleterious stimulant, is becoming more and more familiar to Americans, but the vice bears no comparison to that of China. The moment to cure the disease is, however, to strike it in its infancy. With the fearful picture, then, of the destructive influence on the system of the abuse of opium in China, why should not a legal enactment restrain the sale of the fatal drug?

*The Remedy.*

What barrier can be placed to the invasion and progress of these ruinous causes of degeneration? Several I have already proposed. The most important, however, consists in intellectual, moral and physical education. The secret of public health and national endurance is in the promotion of public instruction. Our political and social organization is now the reverse of that of ancient times. Then, education and power were allied in the imperial court; and as in that was associated the idea of the God-head, it comprised the unbounded influence of reli-

The chief of the nation was its divinity, and all laws for the happiness of the people, founded on justice and consolidated by idolatry, emanated from the throne. While the throne remained pure in principle and virtuous in act, the nation governed progressed in enlightenment, flourished in its institutions and population, was influential in peace and invincible in war. Its world-renowned monuments—the admiration of every age—attest the riches and grandeur of such States. The moment corruption and licentiousness penetrated the palace, the nobility caught the rapid contagion. They quickly contaminated the public mind, and from that hour commenced the ruin and downfall of the nation. In our own Republic, the wisdom of the public councils reflects only the knowledge of the people. As they are instructed in virtue and science will they select the representatives of their mind in Senates and Assemblies. From degenerate and ignorant sources cannot emanate the lofty principles and excellent laws which win the admiration of rival powers, and perpetuate the nation. Hence, it is in the deficiency of education, which should be all-pervading, that may be found the incessant routine of inoperative laws, unconstitutional enactments, time wasting appeals, and decisions reversed. The greatest feature in the art of creating an enduring nation is in the radical education of its youth. Where and how shall this cultivation of youth commence? It is in the education of women. The matrons of a State form its heroes. Therefore should the cultivation of women embrace not only beautiful and graceful accomplishments, but substantial education, the acquirement of physiological instruction, and the care of the physical development of the form. The vigorous constitution begets the energetic mind. To quote a recent writer: "Specially should females be taught the responsible duties of maternity, in order that a race of better developed beings may bless the world; one of fewer excesses; one of more harmoniously developed natures; one of more healthy progenitive or hereditary influence. When women are thus taught, no fear need be had for the youth." Says Michelet: "*Woman is an altar*, a pure and holy one, to which man, shattered by the vicissitudes of life, repairs, day by day, to renew his faith and restore his faltering conscience, preserved more pure in her than in him. *Woman is a school*, from whom, truly, generations receive their belief. Long before the father dreams of education, the mother has profoundly implanted her own, which can never be effaced." In the cause of public instruction, a State cannot appropriate its funds with too great liberality. There is more economy in founding institutions of public instruction than in building prisons and houses of refuge. Their growth decreases the never-ending expenditures on hospitals, asylums and almshouses. Prominent in all education should be that of the physical development. Especially is the remark applicable to that of females. The institutions devoted to their instruction are neglectful of the appliances to improve their physical strength and health. Pre-occupied in the rivalry of precocious minds, they forget that all their success is compromised by neglect of physical health and vigor. Great precocity in youth is seldom followed by healthful old age. It is in the well-proportioned development of both body and mind that the true progress of the people may be discerned.

The health, vigor and beauty of the rising race of California's children might make these observations appear unnecessary. In San Francisco, at least ten thousand youth, the fairest of Heaven's creation, appear to prove the favorable auspices under which we live. The same ratio prevails throughout the State. To foster, improve and exalt these, by

every care in mental and physical development, by every legislative enactment thereto conducive, and by any expenditure which can promote the object, is a worthy labor. If in my views I have taken a wide range, it is because the interest of our State has an equivalent magnitude—for the conservation of our race comprises centuries in its limits.

This essay, published at the time the question of accepting or repelling Chinese immigration from California was before the Legislature of the State, then assembled at San Francisco, failed, notwithstanding any force of argument it might contain, to convince that honorable body, and accordingly the immigration became sanctioned, under severe and unjust restrictions, by statute. This fact proved the prevalence of our republican principles, as regards the rights of man, over the more individual conditions of profit and loss, and also over industrial monopoly and sectarian prejudice.

A candid review, then, of the subject, after ten years experience, cannot fail to be enhanced in value by presenting conflicting opinions in the fairest light, and in close contact with each other. It will thus become more evident to those whose opinions on this rather complex investigation require study and teaching, how much of the argument maintained in eighteen hundred and sixty-two is still tenable, and what modifications the subsequent experience will sanction and demand.

In the short space of ten years time has developed new conditions of things in the relations of the human races. New views of the correlations of the varieties of man have been evolved. Views not new, but suppressed, have received the confirmation and support of new thinkers. The origin of all varieties of men from one pair may not be proved, but a co-fraternity of all nations and the equality of human rights is now acknowledged among the nations whose superiority of intellect gives them the control of the social power. The science of reason is now the motor power of human action; and while this force assumes the ascendant, the light of hope may brighten the prospect that with the continuous unification of nations will follow a unification of languages, of moneys, of weights, of measures, and possibly, also, of religious doctrines.

A moment's glance at this question will show, in political economy, the immense gain of both time and money in the education of youth, in the promotion of general industry and the diffusion of knowledge. This system will suppress wars, will obtain in religion what theologians have failed to accomplish, and by harmonizing the reciprocal respect of nations, unify into one treasury the combined results of general civilization. Ten years, however, have not altered the views taken in eighteen hundred and sixty-two, on Chinese immigration, as regards the physiological effects of the amalgamation of inferior stocks with superior varieties of men, and the decay of a nation effected by the introduction of degenerate species of men in vast numbers. On this subject I have nothing to retract. As regards the "remedy," or the modes of repression and restriction of such an evil, I must recede from former admissions. The platform of prohibition then taken is no longer tenable; and the next best means to comply with the just demands of human progress and winnow off its present evils and ancient prejudices remains to be sought. Whether or not, in eighteen hundred and sixty-two, I may have been right or wrong, is of little import. Human intelligence is fast expressing its master will. The fiat of political equality has been pronounced. It has been written with the blood of two

wars and confirmed with the seals and witnesses of two treaties of peace. May they prove in the Christian sense treaties of peace unto all men throughout the world.

The manifest destiny of man has changed its course from the *antagonisms* of "balance of power," by ephemeral and impracticable treaties, to find relief in the *natural attractions* of the universal sympathies of all mankind. In these the Mongolidee will participate.

Any one who, desiring to inquire, will consult the work of Latham on the varieties of man, may learn who are the "Mongolidee." He will find, not the unfortunates who, with proper exceptions, represent them in San Francisco, but vast peoples, governing one-half or more of the area of the globe; peoples possessed of almost unlimited resources in intelligence and refinement, according to their theories of life and education; of immense commercial extension; of indefatigable industry and thrift, and of almost countless wealth.

The thirteenth and fourteenth amendments to the Constitution of the United States, and especially the fifteenth—"The right of citizens of the United States to vote shall not be denied or abridged by the United States, or by any State, on account of race, color or previous condition of servitude"—effectually quiet all question. As naturalization follows immigration, so will the suffrage be the next consequence. This admission to citizenship is accompanied by international treaties, to secure all the privileges of "the most favored nations." In the face of this, "the preventive remedies" suggested (page 63) must necessarily fall to the ground, and alternatives be resorted to, with which to derive the utmost benefit, and escape the evils of degenerative amalgamation. A serious objection advanced against the immigration of Mongolians, especially the Chinese, is their religion—that they are "*heathen*." In my former essay (page 65) is the following: "The anti-Christian religions of Asia should constitute an insurmountable bar to the free admission of Asiatics on this continent." This expression I must now revoke; but the closing remark (page 66, Part I) appears to have come more rapidly to its accomplishment than could have been foretold ten years ago. "The moment to review our national policy, repeal preventive laws, and admit Asiatics to the privileges of freemen," has in this decade been realized. If this be admitted in political freedom, so must it become in religious freedom.

The contrast of every-day, practical religion, as taught in our own faith, with that of the Chinese, is more apparent in the *form* than in the *fact*. It is not a little surprising that a religion which has had but eighteen hundred and seventy-one years of existence should be so arrogant against faiths which have, with varied modifications, had their worshippers since the date of the creation of man on the earth. If you will calculate the immensity of the latter date as compared with the former, your principles of Christianity will inculcate more forbearance. After all, the study of the moral philosophy of Confucius, the perusal of the sacred books of the Chinese, and a fair comparison of the laws of the Chinese, their code of morality, their daily usages and social customs, will show that the great moral platform of both is established on the same basis. If a nation's moral laws are the effect of its religion as their cause, then are the foundations of both the same. The variation is only in the details of the superstructure. The facility with which great conversions have been made among heathen people is in the fact that, after all, the elementary principles are identical, and the introduction of Christianity is only the addition of a more brilliant light to that which

already guided the wanderer of the desert. The light of educated intellect—the genius of universal philanthropy—was added to the misty dullness of ignorant superstitions.

Is it not, then, remarkable that while Christian associations of every denomination have spent millions of money in foreign missions, to convert the "heathen," that now, when a manifest destiny, operating with uncontrollable rapidity, is saving all the pious zeal, and is bringing home to us these heathen, a voice of horror and of contempt is raised against them? Can they not be more conveniently and more cheaply converted if brought home to us, than by going so far in the doubtful pursuit? Is not the bird in the hand worth two in the bush?

The inconsistency of religious enthusiasts in thus repudiating the foreign race has occasioned the disgraceful raids and petty tyrannies practised against these people. That inconsistency would be resolved to the honor and benefit of our religion and our nation by adopting the rational, practical and truly Christian method—practise what ye preach, "good will to all mankind."

If the Chinese are depraved and beneath equality, scorn and blows will not teach them faith. The elevation of their character will follow the gentle instruction of their minds. The new inspiration of the mind, giving increased energy to the brain, will diffuse its stimulus to every nerve, to every muscle, to every organ and every tissue of the body. The repaired body, reacting in its turn upon the revived intellect, will exalt and regenerate the entire race—a new mind and a new body, worthy of the progressive destiny of man, will result.

This method will constitute a truly national "*conversion*" of the heathen. The first conversion to effect is the minds of the intolerant. To the antagonism of religions, then, I would substitute the prevailing ideas of unification of faiths.

Inasmuch as the Mongolian immigration is an irrepressible portion of the general migrations of men now in progress, I would co-ordinate it in accordance with the natural laws of the correlation of nations.

If received with affection, it will accept with gratitude; if taught with kindness our language, our science, our art, our manners, it will learn with alacrity; if inspired with our religion, it will respond with devotion; if, in lieu of rice, it be fed with our nourishment, it will develop with our strength; if incorporated in our national system, its labor will immensely augment our national wealth. Here, then, to genuine humanitarians, is opened a new school of public education.

No one will longer deny that the stock of this race is not good. The natural quickness of intelligence, the thrift, the indefatigable industry, the education—for they can all read and write their language—their quick adaptability to all works, and their strong physical development when not repressed by poverty, starvation, opium and excessive labor, prove this fact. These elements render the stock worthy of association in a nation which of all others the most requires those qualities for its advancement.

The question to examine is, how to provide for or against the assimilation of the races when they meet and live in contact; how obviate the deterioration of the more highly developed variety of the human family?

It is to be borne in mind that the specimens of Mongols in San Francisco are the low forms of their race. They are the men whose life has been a constant struggle with the most destructive of decomposing

agents, physically speaking, and of the degenerative influences of a moral and psychological nature.

The constant effort of inorganic nature to reduce and deteriorate the organic forces of life has been impressed upon them for a long succession of years, without the counteracting exertions of either hygienic, humane or political interference.

Notwithstanding the patriarchal system of their government, under which provision is made to protect the poor in time of dearth, the pressure of an overgrowth of population has far outweighed the resources of Government, and vast populations have lingered in irremediable want.

Extreme poverty, the most meagre nourishment, insufficient clothing and lodgment against the inclemency of climate, have co-operated to impair their growth. The consequent diminution of the necessary animal heat to develop strong animal tissue has weakened their physical construction. Again, exposure under such conditions to malarious atmosphere poisons more profoundly the blood circulation on which the action of the brain depends to provide nerve force to muscular power and digestive activity. This enervating agency, more prevalent and more highly concentrated in Asia than in America, not only degenerates the body but depraves the mind.

If to these causes of decay be added the enervating action on the mind and body of the abuse of opium, apology enough is offered for the repulsive aspect of this class of the Mongol race.

Any one of these causes of decay is enough to destroy an individual. When they have all coöperated during generations of men to sap the vital vigor of the lower classes of the nation, their generally enervated and exhausted aspect may be comprehended. But in the immigration of Chinese to America, necessarily commencing with the inferior and poor stock, there is a recourse against evil contaminations. This relief against the evil will act in a constantly increasing force and ratio. If race blood can be impoverished, so can it also be enriched. The most valuable truth to be derived from the elaborate demonstrations of Darwin, in regard to the descent of man, is the progressive perfectability of man. His descent may be humiliating to his pride, but standing erect, as he does, on the highest Alp of the perfection yet attained, he is still reaching a higher altitude in his ascent to a grander and more elaborate evolution. Of what avail is it that Mr. Darwin should demonstrate the ignoble *descent* of man, if his argument may not be practically applied to promote his ascent to a nobler perfection. If the descent under the gradual exercise of natural laws have been slow, the reascent of a people fallen back under the influence of, to him, unnatural forces, must be rapid, for it is only the repair of a state of perfection accidentally disturbed, but, in fact, actually established. It must follow, then, that the race which has outstripped his neighbor in the march of perfectibility, from having enjoyed more favorable advantages, may take up that neighbor and carry him with his own progress to his own grade of elevation.

If descent (lineage), under the gradual exercise of natural laws, have been slow, or if man is derived by a gradual improvement from the lower animal forms, and has through varied modifications progressed to his present high development and civilization; and if the converse be also true, that man may retrograde in his race qualities, both physical and mental, by the vicious influence of bad animal life and bad moral environment, why may not a great and ancient family, which is proved the earliest progenitors of mankind, but which by the slow action

of corrupt influences may have fallen into decrepitude, be again elevated to the highest standard?

I have not the pretension to discuss or dispute the theory which scientists appear to accept on the proof of facts, but only avail myself of its principal merit—the gradual perfectibility of race. The most difficult part of the problem, and therefore the slowest to reach, has been attained, viz: the conversion of the brute into the man; but now, after a lingering series of transitions, that we have got the man, the progress of his perfectibility may be accelerated in proportion to the forces applied to his education. Divest our own proud race of the loads of false education it is forced to bear, and, perchance, its own improvement may be promoted. What would be the first step to divest this man, who denounces his heathen neighbor, of this burden. Certainly it would be to teach him that this Mongol race is his own true progenitor. Let the people of the great modern west learn that they derive indirect descent from the great ancient east; that the Caucasian, in his migration across the American Continent, and now bridging the Pacific Ocean to penetrate again the regions of Asia, is only carrying back his ideas and wares to his ancient homestead and restoring to their cradle his antiquated birthrights. The improved conditions under which he returns may be offered and accepted as interest on the long loan he has enjoyed of ancient enlightenment, law and religion.

With his return I delight in the conviction that he presents himself in a more noble and more alluring garb. No more shall his hostile power, supplied with implements of destruction which abused science has provided, and which places his opponent in unequal strife, because he cannot produce, appear to despoil and destroy. Nor will Russia, England, France, seek to overwhelm, and then absorb by violence, the venerable patrimony. But now, guided by science, influenced by reason, illuminated with charity, acknowledging the free rights of all men, and imbued with the divine principle of universal love and respect, will re-enter the old ancestral estate, to rebuild, to restore and revitalize its ancient historic greatness.

This system the Orient will accept. The Saviour of India will embrace the Saviour of the world. In resisting the former system Asia withers. Draw a gem from this cradle as a specimen. It refers to the rites and practices of purification:

“The truly wise, twice regenerated, who live in constant contemplation of God, can be defiled by nothing in this world.

“Virtue is always pure, and he is virtue.

“Charity is always pure, and he is charity.

“Prayer is always pure, and he is prayer.

“Good is always pure, and he is good.

“The divine essence is always pure, and he is a portion of the divine essence.

“The sun’s ray is always pure, and his soul is like a ray of the sun, that vivifies all around it.

“Even his death defiles not, for death is for the sage, twice regenerated, a second birth in the bosom of Brahma.”—*Veda*.

If this illustration from the most ancient records of the world is not sufficient evidence of the high standard of Asiatic enlightenment, morals, poetry, literature, nothing will suffice; and such examples, in the field of theology, moral laws and social economy, are abundant throughout



literature. It is not, then, by scorn and oppression—repeating the old persecutions of theocracies, from which the world is now seeking its emancipation—that these people can be regenerated, and become utilitarian co-agents in the progress of civilization by reason.

The studies of the most learned philologists of different countries, entirely disinterested among themselves, have penetrated the ancient languages of Asia, and have proved, not only that the Greek and Latin and European languages are derived from them, but that the origin of our own religion is in their works, and that the sources of our own Bible are but a transcript of the Vedas of India.

We may thus discover that, after all, these peoples are not so heathen as they appear, and that the exhibition of our own Christianity, in extending to them the right hand of fellowship, is not only our duty, but their right.

Another subject to consider, in the matter of amalgamating an inferior with the superior race, and the danger of national degeneration, is the fear that the Mongol mixture will become too widespread for safety—that the Mongol cross, added to the already very large negro cross, will become large enough to overbalance and finally extinguish the pure Anglo-Saxon. This is an important question for decision. It is justly to be borne in mind that the European families are derived in direct descent from the families of Central Asia. The migrations westward from the lofty regions of India gave origin to the present European stock. The migrations eastward from the same elevated centre peopled and absorbed the aborigines of China, Japan and Oceanica. There is, consequently, the same ancestral origin. This circumstance renders amalgamation more natural and acceptable than assimilation with the negro (*Atlantidæ*, Latham) race. The one is restoring an ancient family; the other is almost the creation of a new race, already shown to be too faulty to be worth the cultivation.

This brings us to establish, if possible, a practical and available advantage from the Darwinian ideas of "natural" and "sexual selection." If these ideas, derived from long-continued observation of the instincts of humanity, possess any value, here is a grand and wholesale occasion to estimate the force of these affinities. If the conclusions of these ethnologists are true, the races will not blend. Numerous exceptions will occur, but they will fall in their subordinate place. The nation will have nothing to fear from the experiment. The influence of winnowing the good from the bad, the strong from the weak, by the action of natural selection, will herein find its apt and useful application. The improved condition of every external physical agency which can modify and improve the human constitution, cannot fail to invigorate the new race. The better brain will produce better mind, and thus elevate its moral and intellectual culture. Again, "sexual selection," wherein the preferences of individuals for association with one another control their union, will for ages to come keep the races distinct. This attraction, which guides the affinities of individuals of a like race, will be, as it always has been, the barrier against the amalgamation of anti-sympathetic races.

The limits of this report do not permit further analysis of these two great forces, viz: the action of natural and sexual selection in the development of man. The great progress of events has chosen California as the elected place for the action of these great laws on the grandest scale of nature. Their power is appealed to incessantly, on the science and teachings of the day, to exalt the European race still higher in its career. They may be applied, with more rapid and fertile har-

vest, to the Mongols and the Atlantidæ. They will prevail; and man may, in the words of Alf. Russell Wallace, "continue to advance and improve, till the world is again inhabited by a single nearly homogeneous race, no individual of which will be inferior to the noblest specimens of humanity."

Respectfully submitted,

ARTHUR B. STOUT.

## SCHOOL-ROOM DISEASES.

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TRANSLATED FROM AN ARTICLE BY DR. R. VIRCHOW, BERLIN, PRUSSIA; AS  
PUBLISHED BY THE BUREAU OF EDUCATION, WASHINGTON, D. C.

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This subject, one of the gravest importance to the future of our nation, deserves much more attention than has hitherto been devoted to it. Too exclusive care has, perhaps, in many cases, been bestowed on the mental development of the young, frequently overburdening the youthful mind, the truth of the old adage, "*Mens sana in corpore sano*," being forgotten. This neglect has, no doubt, in more cases than people generally suppose, borne its evil fruits, and it is time that this whole subject should be more thoroughly investigated. Even in Europe, the science of school pathology is yet in its infancy; but the greatest interest begins to be felt in it, not only by medical men and educators, but also by the public generally. Among the recent contributions, the pamphlet entitled "On certain influences of schools detrimental to health" ("*Ueber gewisse die gesundheit benachtheiligende einflüsse der schulen*"), Berlin, eighteen hundred and sixty-nine, has attracted considerable attention. It is written by Dr. Rudolph Virchow, one of the most eminent medical men of Germany, since eighteen hundred and fifty-six, Professor of Medicine at the University of Berlin, the famous originator of the so-called cellular pathology. Many of his works have been translated into English and other languages, and extracts have been given of the pamphlet alluded to above, in different papers.

The detrimental influences of schools on the health of children have frequently attracted the attention of physicians and educators, especially during the present century, but have not, until quite recently, been made the subject of thorough and scientific investigation. Certain general experiences, certain seemingly well-established assertions, gradually found their way into the books, and even became household words among the educated classes. Very few, however, would have been able to adduce even the most meagre facts as a basis for such assertions. Only sporadic attempts were made in this direction, and it is but lately that the progressive spirit of the times has prompted men of science to gain a basis for counteracting an existing evil by collecting statistics of what may be termed school diseases.

Trustworthy and extended comparative statistics are the only means of forming a clear judgment on the evils or diseases produced by schools, and on the true way of remedying them. Wherever this basis is wanting, general scientific rules, applicable to many other institutions besides schools, may to a certain extent serve as a guide; but it cannot be

denied that, merely by following such rules, many important points will be overlooked, and a mistaken judgment formed of others. In the following, a careful distinction will be made between evils actually established by facts, and such as have only been estimated. Among the former rank first in importance—

1. *Eye diseases, especially short-sightedness.*

The first investigations as to the influence of schools on the eyesight were made in the beginning of this century by an Englishman, Mr. Ware. Many similar inquiries have been made since, but without any trustworthy results, because they were not carried on systematically. The first reliable facts, based on the most thorough investigations, were published in eighteen hundred and sixty-six, by Dr. Herman Cohn, of Breslau, Prussia.

He has examined five village schools in Langenbielan (a village of Silesia), and the following schools in the City of Breslau: Twenty elementary schools, two higher girls' schools, two intermediate schools, two real schools (non-classical colleges), and two *gymnasias* (classical colleges). Of the ten thousand and sixty scholars in these institutions, Dr. Cohn examined six thousand and fifty-nine himself, while the remainder were examined by the teachers, according to careful instructions. Of the students of the University of Breslau, Dr. Cohn personally examined four hundred and ten. Among the ten thousand and sixty scholars, 17.1 per cent. were not in the full normal possession of their eyesight. Distributed over the following schools, the result was as follows:

Schools.	Per cent.
In the village schools.....	5.2
In the city elementary schools.....	14.7
In the intermediate schools.....	19.2
In the higher girls' schools.....	21.9
In the "real schools".....	24.1
In the "gymnasias".....	31.7
Of the students of the university.....	68.0

Leaving out of the question astigmatism, oxyopia and actual diseases of the eye, there are nevertheless ten per cent. near-sighted, distributed in the following manner:

Schools.	Per cent.
In the village schools.....	1.4
In the city elementary schools.....	6.7
In the higher girls' schools.....	7.7
In the intermediate schools.....	10.8
In the "real schools".....	19.7
In the "gymnasias".....	26.0
Of the 410 university students examined.....	60.0

This shows that near-sightedness steadily increases from the lower grade of schools to the higher ones. The same principle of increase may be observed in each of these schools, taken separately, showing a gradual increase from the lowest to the highest class, according to the following percentage :

## CLASSES.

	VI.	V.	IV.	III.	II.	I.
Elementary schools.....	—	—	2.9	4.1	9.8	9.8
Gymnasia.....	12.5	18.2	23.7	31.0	41.3	55.8

Not only does the number of short-sighted cases increase from one class to the other, and from one grade of school to the other, but also the degree of short-sightedness. It would, of course, be absurd to ascribe the enormous extent of myopia exclusively to the influence of schools, as it is evident that many other influences outside of the school contribute to produce this result. In order to give a correct judgment on this point, more extensive researches would have to be made among apprentices and journeymen mechanics of the same age. It may, nevertheless, be safely asserted that, of the young men of the same age as the scholars of the first class of a gymnasium, there are, on an average, not fifty-five per cent. short-sighted persons, and among those of the same age as the students of the university, not sixty per cent. Among the chief causes of near-sightedness Dr. Cohn considers the construction of the desks and chairs, and the manner in which school rooms are generally lighted. Scholars but too easily accustom themselves to bend forward too closely over their books. This involves greater activity of the muscles of the eye, producing an increase of hydrostatic pressure in the back part of the eye-ball, and a prolongation of the axis of the eye, which by long continuance becomes a permanent condition. On the other hand, the bending forward occasions a rush of blood to the eye-ball, also increasing the pressure in the back part of the eye. These two causes combined, Dr. Cohn says, produce near-sightedness. Other physicians explain the causes somewhat differently, but they all agree in considering a prolongation of the axis of the eye as the immediate cause of myopia.

## 2. Congestion of the cerebral circulation.

Three evils resulting from the congestion of blood in the head have recently been made the subject of researches by Drs. Guillaume and Th. Becker, viz : headache, bleeding of the nose and goitre.

(a.) *Headache.*—Guillaume found, among seven hundred and thirty-one scholars of the *Collège Municipal*, in Neufchatel, two hundred and ninety-six—more than forty per cent.—who frequently suffered from headache. Girls seemed to be more subject to it than boys, for among the former there were fifty-one per cent., and among the latter twenty-eight per cent. The younger scholars suffered more from it than the older ones. Becker examined three thousand five hundred and sixty-four scholars of all the public schools at Darmstadt and Bessungen, and of three private schools at Darmstadt. Of this number, nine hundred and seventy-four, or 27.3 per cent., suffered more or less of headache. It appeared that, in the common city schools, the number of children afflicted with headache was particularly large in the lower boys' classes, while in schools of a

higher grade the number was larger in the most advanced classes. In the highest class of the gymnasium, 80.8 per cent. were sufferers from headache. Besides too close school rooms, to which Becker, in addition to too severe mental exertion, ascribes the frequent occurrence of headaches, Deville and Troost, in the session of the French Academy of Sciences, on January thirteenth, eighteen hundred and sixty-eight, mentioned as another cause the fact that different species of gas, particularly carbonic oxide, will penetrate red-hot iron, which, they say, frequently occurs where there are iron stoves. The noxious influence of this gas in producing headache and giddiness is well known; but more thorough investigations are required to show the exact extent of this influence in school rooms. Dr. Oidtman, in a pamphlet published on this subject in eighteen hundred and sixty-eight, does not hesitate to consider the chronic poisoning of school children, by carbonic oxide, as of frequent occurrence.

(b.) *Bleeding of the nose*.—Guillaume found one hundred and fifty-five scholars (twenty per cent.) subject to it, more frequently among boys (twenty-two per cent.) than among girls (twenty per cent.). Among the former a steady decrease could be noticed in the higher classes, while among the latter it was less regular. Becker found only 11.3 per cent. suffering from nose-bleeding, most cases in the higher classes of the gymnasium, the higher girls' school, and a private school of a higher grade—in those schools, in fact, where the scholars had to sit longest in the school room, and had least exercise in the open air.

(c.) *Goitre*.—Guillaume, who has first drawn attention to this disease, and actually calls it "*goitre scolaire*" (scholars' goitre), found four hundred and fourteen cases (fifty-six per cent.)—one hundred and sixty-nine boys (forty-eight per cent.) and two hundred and forty-five girls (sixty-four per cent.). He does not consider goitre endemic in Neufchatel, and affirms that it frequently disappears during the vacation, but shows itself already in girls of eight years of age, after having attended school for one year.

As yet, Guillaume's researches are the only ones made with regard to this disease, and it is a question whether more general investigations would prove the same; it can, however, not be doubted that females are in early youth predisposed to goitre, and that any apparently slight additional cause may bring about this disease. Headache and bleeding at the nose, on the other hand, are well-known school diseases; but as, even with regard to these, our experiences do not warrant us to draw any binding conclusions, it would be well if the teachers could, according to instructions by a competent physician, keep a careful list of all such cases, and compare the numbers thereby obtained with the state of the school, the classes, the time of instruction, the season of the year, the ventilation, lighting, etc.

There is no doubt that congestion of blood in the head has a serious influence on the mental capacities of the scholars, even producing, if it has become habitual, dangerous diseases of the brain. Some physicians even go so far as to make the school, to a large degree, responsible for epilepsy, St. Vitus' dance and insanity. The facts upon which such assertions are based are, however, few and not well authenticated. The field of inquiry has not yet been extended enough, and it must suffice for the present to have intimated the possibility of such a danger, which only then in reality becomes a danger when a particular predisposition offers an open point for such attacks.

### 3. *Spinal diseases.*

The majority of those physicians who have devoted special attention to school hygiene, and a large number of orthopedists, maintain that the school is in a large measure to blame for distortions of the spine, especially for what is called *scoliosis*.

Fahrner, in his work. "The Child and the School-desk" (Zurich, eighteen hundred and sixty-five), says: "Since almost ninety per cent. of all these distortions commence during the years of schooling, and since the character of the distortion corresponds exactly with the position occupied in writing, one feels certainly justified to consider the school as the chief cause of this disease." Guillaume says that, among seven hundred and thirty-one scholars examined, he found two hundred and eighteen (almost thirty per cent.) whose spine was distorted. All orthopedists are unanimous in declaring that the majority of the cases of scoliosis originate during the time of schooling. Klopsch, in his "Orthopedical Studies and Experiences" (Breslau, eighteen hundred and sixty-one), sums up the results of the physicians' experiences, and finds that the majority of such cases originate between the tenth and fourteenth years; only Eulenburg takes the ages of seven to twelve, and, in a later essay on the subject, from six to ten. This does not, however, make any material difference, as all these years embrace the school age.

It is less certain whether the school, as such, is the chief cause of scoliosis, because there is as yet a great lack of comparative statistics. A special objection against making the school at all responsible for it is the fact that scoliosis is almost exclusively a female disease. Guillaume counted among three hundred and fifty boys, sixty-two cases (eighteen per cent.), and among three hundred and eighty-one girls, one hundred and fifty-six cases (forty-one per cent.). This includes, of course, a great number of light cases, which, from a pathological point of view, cannot at all come into consideration. The experiences of orthopedists, mostly concerning serious cases, are far more striking. Klopsch says that eighty-four to eighty-nine per cent. of all those afflicted with scoliosis are females. Adams (Lectures on the pathology and treatment of lateral and other forms of curvature of the spine, London, eighteen hundred and sixty-five,) found among one hundred and seventy-three cases of scoliosis one hundred and fifty-one females and only twenty-two males. Knorr, in Munich, among seventy-two cases, sixty females.

From these figures it will be evident that the school is not the only cause of scoliosis, and experience shows that it frequently occurs with girls who do not attend the common school at all. Some orthopedists, as Bouvier, of Paris, deny to the different occupations all influence on the spine, but a positive experience, which imperatively forces upon us an opposite opinion, is the overwhelming majority of cases where the spine is distorted toward the right side. Thus Adams found among seven hundred and forty-two cases of simple scoliosis six hundred and nineteen where this was the case. This is the very position characterized by Guillaume as the writing position, which, of course, also is applicable to drawing, needlework, etc. Parow says that among two hundred and eighty-two cases of scoliosis he observed two hundred and eighteen (seventy-nine per cent.), where no special external or internal diseased state could be assigned as the cause of it; but where exclusively a habitually distorted position of the body must be the cause. It does not necessarily follow from this that the distortion of the spine is merely caused by the pressure of the muscles (*muskel-wirkung*), as some orthopedists maintain. It is certain that the vertebræ thereby undergo cer-

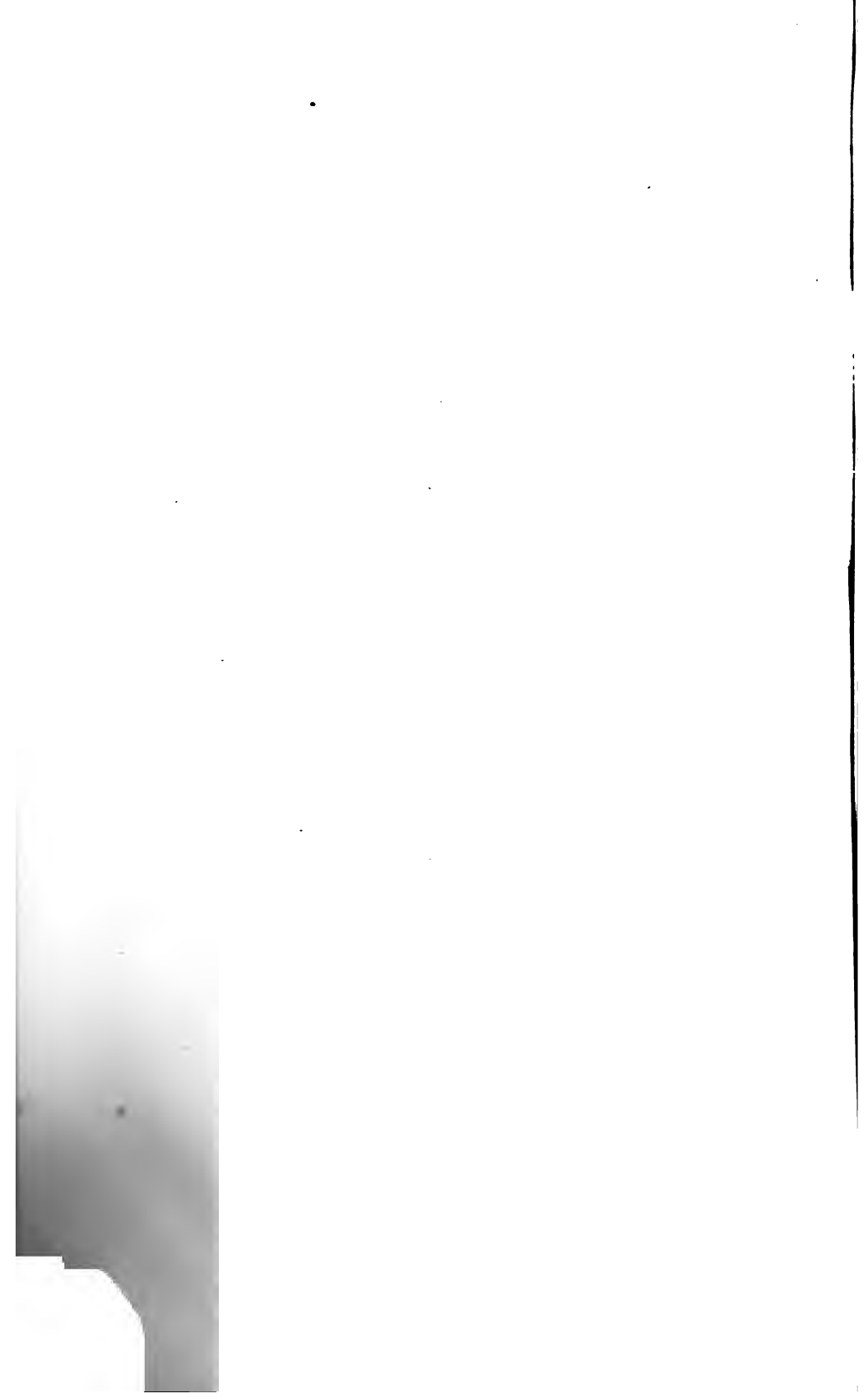


BAD POSITION WHEN WRITING.



BAD POSITION CAUSED BY TOO HIGH A TABLE.





tain changes which gradually assume a more lasting character. These changes take place during a time when the whole body, and consequently also the vertebræ, is yet in a period of development. These changes produce abnormal shapes of the vertebral bones, changes their relative position and extend to the thorax, the pelvis and even to the facial bones, and thereby exercise an influence on the different organs contained in all these parts. According to the spirometric measurements made by Schildbach, of Amsterdam, the opening for breathing (*die athmungsgrösse*) decreases by one-third in children of thirteen to seventeen years, afflicted with scoliosis. There is as yet great diversity of opinion among medical men as to the exact manner in which such changes take place; the results, however, are apparent to all, as well as their immediate causes. (See accompanying drawing.) Great attention should, therefore, be devoted to the position of the body during school hours, and ample opportunity should be offered, by a regular system of gymnastics, to counteract all these evil influences.

#### 4. *Diseases of the respiratory organs.*

Among these diseases pulmonary consumption, in connection with scrofula, is most frequent. Carmichael relates that in a school which had no yard, and where, consequently, the children had to stay in the school room all day, there were among twenty-five girls, of whom none had any disease when they entered, seven cases of scrofula. Arnott was commissioned to examine a boys' school at Norwood, among the scholars of which (numbering six hundred) scrofula was quite common, and where the ratio of mortality was very large. The evil had been ascribed to poor and insufficient food, but on close examination it was found that the food was sufficient and of good quality, but that the ventilation was very bad. When this was remedied the scrofula gradually and entirely disappeared. Many similar cases might be mentioned. With regard to Berlin we have exact tables of the different ages and the different diseases of which people die. If from these we select the persons of school age, we find a rapid increase of deaths from pulmonary diseases during the ages of ten to fifteen, commencing already in the period from five to ten, and increasing considerably during the period from fifteen to twenty. To every one hundred deaths there were 4.81 of pulmonary consumption between the ages of five to ten; 12.96 of pulmonary consumption between the ages of ten to fifteen; 31.88 of pulmonary consumption between the ages of fifteen to twenty.

As the chief causes of such diseases must be mentioned: 1. The vitiated air, by reason of so many children being crowded in one room. 2. Frequent colds produced by the change from the hot school room to the cold air, etc. 3. Dust in the school room. 4. Impaired respiratory movements produced by continued sitting. Till quite recently the views regarding pulmonary consumption were very contradictory, because this disease was simply considered the same as tuberculosis, and therefore classed among the hereditary diseases without any known cause. More recent investigations have shown that by the name pulmonary consumption a number of different processes were understood, which sometimes show themselves at one and the same time, and sometimes one after the other. Most of them begin with a slight catarrh, in most cases produced by cold, or the inhalation of dust, small particles of coal, etc. This brief view will be sufficient to show the danger of an ill-ventilated and poorly superintended school, and likewise show that there is ample cause for

ascribing the origin of the majority of fatal cases of pulmonary consumption of persons in school age to the school as such.

##### 5. *Organs of digestion.*

Here we can only point to the fact that continued attendance at school frequently results in dyspepsia, and all the evils consequent thereupon. Want of ventilation and exercise, and excess of mental work, must be mentioned among the chief causes.

##### 6. *Organs of generation.*

Leaving here entirely out of the question the dangers of bad example, it cannot be denied that long continued sitting, mental excitement, interruptions in the functions of the organs of digestion, etc., must exercise a detrimental influence on the organs of generation, especially in girls' schools, where circumstances during the period of puberty impose upon the teacher, as well as upon the physician, an exceedingly difficult task. The necessity of having experienced ladies as teachers in girls' schools is but too frequently overlooked. This whole subject is very thoroughly and scientifically treated by Dr. Gast, in his work, "A Physician's Suggestions for a Reform of the Public School System in Saxony" (Leipzig, eighteen hundred and sixty-three).

##### 7. *Contagious diseases.*

Certain contagious diseases, such as scarlet fever and measles, are so exclusively children's diseases that they need not be mentioned here. It cannot be doubted, however, that other diseases, as small-pox, cholera, diphtheritis, etc., find a favorable field for extension in schools. Typhus and dysentery cannot come into consideration, for, although cases might be mentioned where, in consequence of impure drinking water, these diseases assumed the character of an epidemic in a school, they are exceptional. A wise legislation, strictly carried out, is the best means of preventing the spreading of contagious diseases.

##### 8. *Wounds and other injuries.*

Wounds, bruises, etc., are occasioned by accidents during the recreations, by scholars striking or hurting each other in different ways, and, finally, much more frequently than is generally supposed, by inadmissible corporal punishment by the teacher. There are no statistics on these points, but the facts are beyond doubt. In all the three cases mentioned the result is produced by negligence on the part of the teacher or scholar.

Reviewing all the facts which have been but very briefly mentioned, we find, first of all, that there is an almost entire want of statistical material, and that as yet school pathology does not exist as a science. If, however, undoubtedly existing evils are to be remedied, the first and foremost condition is to obtain the fullest possible statistics. This may in part be done by the teachers, but the chief work can only be done by physicians; physicians who are thoroughly conversant with school hygiene, and the modern methods of investigation. It is indispensable that the sanitary care of public schools is placed in the hands of competent physicians. They must first of all carefully define the dangers to which children in school age are exposed, and by comparing their different reports we shall gain a clear view of the school diseases of a whole place or country; and compared with the conscription statistics, if conducted in the way in which the statistical congress of eighteen hun-

dred and sixty-three demands, such statistics will form the basis for a thorough knowledge of the bodily development of a nation. Only after this preliminary work is done the question in how far certain diseases are connected with certain school institutions can be discussed; and to arrive at a final conclusion, a committee of educators and physicians should be appointed, who could take this whole matter into their hands.

It is not probable that more thorough investigations will bring to our knowledge diseases and causes of disease hitherto unknown. Their number is already now pretty well defined. The chief causes of disease are:

1. The air of the school room, the condition of which is dependent on size of the room, the number of pupils, the heating arrangements, ventilation, dampness of the floor and walls, dust.
2. The light of the school room, dependent on the location of the building and the room, size of windows, color of the walls, artificial means of lighting a room (gas, oil).
3. The arrangements for sitting, size and form of chairs and desks, length of time scholars are obliged to sit still in one position.
4. Bodily exercises, especially out-door games, gymnastics, bathing, arrangements for such, manner of superintending them.
5. Mental exercises, extent, manner in which they follow each other, individual measure, length of free time and vacation, etc.
6. Punishments, particularly corporal punishments.
7. Drinking water.
8. Privies.
9. School apparatus, especially text books (size of print, etc.).

Many of the questions agitated are, of course, more of a pedagogical nature; for example, what may be demanded of a scholar, what text books are to be used, in what manner the free hours and vacations are to be distributed, etc. But many even of these questions will only be solved correctly if school men and medical men will go hand in hand. Only by thus working harmoniously together, by thus mutually enlightening each other, will the State gain an organ to which may be safely intrusted the solution of the great question of our time, viz: bodily and mental health, and development of future generations.

# SCHOOL HOUSES AND THEIR VENTILATION.

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A LECTURE DELIVERED BEFORE THE "SACRAMENTO COUNTY TEACHERS' INSTITUTE," ON 27<sup>TH</sup> APRIL, AND BEFORE THE STATE TEACHERS' INSTITUTE, IN SAN FRANCISCO, ON THE 8<sup>TH</sup> NOVEMBER, 1871.

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BY THOS. M. LOGAN, M. D.,

PERMANENT SECRETARY STATE BOARD OF HEALTH.

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LADIES AND GENTLEMEN: Some years ago I had the pleasure of delivering a lecture before your Institute on "School House Architecture in its Hygienic Relations." Since then I have not ceased to take a lively interest, not only in your Institute, of which you did me the honor of electing me an honorary member, but, also, in every subject appertaining to the noble cause in which you are engaged. No occasion have I allowed to pass by, either at home or abroad, without informing myself of the progress of society, as demonstrated in the construction of the school house. It is chiefly, therefore, to a continuation of the subject of the former lecture, just alluded to, that I now proceed to invite your attention—while in the legitimate discharge of the functions of Health Officer of the State. At the time just referred to I had but little practical knowledge of the actual comparative status of the California school house. I pictured the ideal, formed in my own mind, to which it should assimilate, and have no reason now to change or modify the fundamental principles and rules then discussed for the guidance of superintendents, preceptors, and building committees—principles which science, reason and experience teach as necessary to render our school houses attractive resorts to the young and conducive to the health, happiness and welfare of the rising generation. I repeat that I have no reason to revoke or correct anything then laid down, so far as the general purport or intent are concerned, *now*, after a simultaneous view of the condition of the whole civilized world in this particular department of the material arts. Had the suggestions, then made, been followed out, California would now hold the first rank in all those appliances whose object and aim are to make education in our public schools harmonious and complete, symmetrical as a whole, and, as it should be, the fullest possible preparation for the successful and easy performance of the duties of life. For education means health, strength and happiness. To make myself better under-

stood, it is proper for me here to state that in eighteen hundred and sixty-seven it was my privilege—the greatest privilege, I conceive, of my whole life—to witness that palpable demonstration of the world's progress, the aggregate product of the world's skill and industry, displayed, as never before, in peaceful emulation, at the Paris Exposition. Then and there the school house was not overlooked by me, and, to the credit of Illinois be it known, that that young, vigorous State furnished a building which, in all respects of adaptation to school purposes, was not only superior to other exhibits of its kind, particularly in respect of neatness and means of lighting and ventilation, but to the average of those found in European countries. This is not alone the result of my own judgment, but also that of the Commissioner\* of the United States, who had abundant opportunity of forming the most correct opinions, and on whose admirable report I shall rely for whatever I may have to say in this respect.

Nothing so peculiarly characterizes the age we live in as the appreciation of the benefits of general education. It is to this condition of society—to the instinctive ambition and provident solicitude which reigns in families—that the department of education everywhere owes its popularity. All parents, of any intelligence, concern themselves deeply as to the healthfulness and abundance of the sources from which their children receive their mental nourishment. By the side of this powerful domestic interest a great public interest thus necessarily places itself. Important to families, the department of public instruction is not less important to the State. Feeling, doubtless, the force of these propositions, put forth by the expanded mind of Guizot, and incited by those lofty and clear instincts which revealed to him the real tendency of the age, Napoleon III, following in the footsteps of his great predecessor, apprehended that to give the parties intrusted with education, respect, dignity, confidence in themselves, and a spirited devotedness to their calling, it was necessary that they should be recognized and linked, as it were, with the progress of the age. He felt that, in the present day, the educational department should be laical, social, connected with family interests, and intimately united, save only in their special mission, with civil order and the mass of their fellow-citizens. Doubtless it was under the influence of such convictions he issued the imperial decree which ordained, for the first time in the history of universal exhibitions, that the grand principle of progress, as exemplified in the common school system, should have practical recognition in the form of a separate division or group. Had he signalized his eventful dynasty by no other noble achievement in the cause of humanity, this one crowning act of his whole life should place his name high up on the page of permanent history, and insure for his memory the benediction of mankind. For there it stands indelibly recorded, in cosmological letters of shining light, that at the head of the group, the scope and object of which warranted the designation happily given it, of "The Department of Social Science," were assigned *objects intended to ameliorate the moral and physical condition of the people*—such as school houses, tract societies' buildings, and habitations, characterized by their cheapness, combined with adaptation for health, cleanliness, ventilation, etc; thus acknowledging these to be first in the logical order of such subjects as directly concerned the social improvement of man.

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\* Hon. John W. Hoyt, U. S. Commissioner to the Paris Exposition, 1867.

To show you how this grand scheme for human advancement succeeded and worked, I find that the number of exhibitors, properly catalogued, were no less than one thousand and ninety-five, distributed over twenty-nine nationalities. The objects themselves numbered many thousands; one entry alone, as that of a school house, for instance, often including many individual articles, collectively shown by the nation, society or individual making such exhibition. The variety of objects was only less than their number, extending through the whole range appropriated to the work of education, and affording ground for a discussion of every educational theme, from the material appliances of the infant school up through every grade of intermediate schools, general and special, to the scheme of the royal academy or university. In the external gardens, or park—for the whole grounds of the Exposition inclosed an area of forty hectares, or about ninety English acres, and were so contrived as to unite the picturesque with the useful, all made subservient to the general purposes of the exhibition—were school yards, with furniture, apparatus and numberless appliances, together with the no less numerous products of the handiwork of the artistic and inventive skill of the pupils. Besides all this, in the numerous halls, saloons and attractive corners of the vast pavilion itself, were to be found charts, maps, atlases, globes, orreries, slates, copy books, contrivances to aid in teaching children to read, write and calculate; text books, from the primer to the calculus and the classics; appliances for pronunciation, and countless other objects, equally appropriate to the work of education, some of them beautifully and effectively set off by portraits, busts and statues of distinguished teachers and patrons of education in all countries, as well as by the inscription of the names and living words of such as, by their labors for the diffusion of knowledge among men, have made them immortal.

From this outline, some conception may be formed of the comprehensiveness of the plan of this important feature of this world-wide collection, and of the profound interest awakened generally therein. The magnitude of its direct influence, as well as of the subsequent benefits likely to grow out of it, can be estimated only by the fact, that, of the more than ten millions of visitors to the Exposition, many zealous men and women came from all parts of the world expressly to avail themselves of just such facts, principles and sources of information that were here afforded. The number of French teachers alone, who visited and minutely examined the displays, is put down at over twelve thousand. Many who had no especial interest in this department, and stood in no relation to it, except that of being mere spectators, like myself, could not have been otherwise than favorably impressed with the wide views of all the eminent men who originated, encouraged, and by their indomitable energy and perseverance embodied the great thought of such a spectacle as universal public education in a visible, material shape.

For my part, when my eyes rested upon the familiar common school building of Illinois, I felt proud of my American parentage, and could not but exult in the wisdom and forethought which have established our prosperity, as a nation, on the noble system of public education. Well may the great masters of the school of reformers, in our day, in our own as well as in other countries, already anticipate for these United States a destiny more glorious and happy than the world has ever witnessed. Have we not laid the foundations of improvement in all broader and deeper than ever people did? In all other have been the result of accident and violence—of singular,

and often of fortuitous occurrences; but with us they are the fruits of system in choice and concentration in effort. In other nations the monarch, the statesman, the philosopher, the patron, has labored almost single handed; but with us, the people have arisen as one man to lay these foundations in the name of Freedom, and in the presence of the whole world. What though the present day is to our people, as it were, *but the primary school*; I would not exchange the bright anticipations of my country's glory, predicated upon the basis of popular education, for the bigotry of the awe-stricken worshipper, either of antiquity, or of that European literature whose laurels spring from the very principles which we are cultivating with more energy, assiduity and ardor than all other nations. "The immense social value of the public school," says one better able to judge than I am, "when carried forward to realize the principles upon which it is founded, is not easily comprehended, because its results are remote and not exclusively material. But it is no exaggeration to say that the Board of Health cannot so promote the public welfare as the Board of Education. Ignorance is only a more intellectual nomenclature for the most pestiferous conditions of sewage, nuisance and miasma. The reply of thousands of men of the highest educational experience, of different sects and professions, to questions propounded by Horace Mann as to the result of the highest development of the common school system, with the best teachers and the attendance of all children during the years appropriate to pupilage, was, that if the system should be thus developed *not two per cent.* of the rising generation of the people *would fail to be good citizens.*"\* Now, just here, where pride of country, reason, and forecast would all naturally incite to exulting vaticinations, predicated upon this American school house in the Paris Exposition, and which has drawn forth this discussion, it is most mortifying to be obliged to confess that it was not up to the times in the important particular of ventilation, and in this respect was seriously faulty. It is true that the Commissioners, through whose agency it was provided, did not aim to present a school house peculiar to their State, nor yet the ideal one of an American educator, but a real one, such as might serve to show the average of those in actual use, as the "cross-roads" and "country school house" of the northern and western States. "Nevertheless it was defective, and in this sense discreditable to the intelligence of the United States, in that it did not properly provide," says the same authority I have already referred to, "for ventilation—though in this respect superior, those from Prussia, Saxony and Sweden, providing not at all—its three large windows opening both from the top and the bottom; while in the others, the windows, besides being inadequate to lighting, had upper sashes that were immovable. Still every one who understands the physiology, so to speak, of ventilation, as well as its chemistry and mechanics, knows that, in winter, this mode of purifying the vitiated air of an apartment, while it effects the intended object, can do so only at the peril of some of the occupants." It is precisely to this one point, *ventilation*, that I have been gradually endeavoring to direct the attention of those conversant with school matters, and hence have advanced the preceding remarks; for on it hinges the burden of all I have further to say.

While it would have been unfair to place on exhibition a building quite

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\* Concluding remarks before the Mechanic Arts College. By Rev. Horatio Stebbins.—*Pacific Rural Press*, July 22d, 1871.



superior to its kind, when assuming to give an opportunity of comparing the actual status of the American school house with those of other nations, it is none the less deplorable, and none the less disgraceful to our own than to other countries, that the importance of thorough ventilation should have had so little practical recognition. The neglect and ignorance of everything pertaining to this branch of architecture, among a people so remarkably quick and clever as the Americans are acknowledged to be, strikes me with a daily growing wonder. While all the whims of European resuscitators have been repeated *ad libitum*, and fashion stamps "high art" on the dusty styles and compositions of past ages—even to the puzzling monogram that proclaims the ownership of our houses—that, without which any building is uninhabitable, is either unknown or ignored by the great mass of both architects and their employers. Some few of the former, be it stated to their honor, are beginning to comprehend this vital want, while the majority of the latter cannot understand why they should have to waste their valuable dollars and cents on anything as cheap and abundant as air.

I have yet to learn of the first building in California, besides the recently constructed "Jefferson school house" in Sacramento, in which a modification of the Ruttan system has been introduced by the architect, Mr. A. A. Cook, that has had the slightest provision made for ventilation.\* And yet in no other part of the world, perhaps, is more attention required for the proper regulation of the ever varying conditions of the atmosphere than in California, where, in the rainy season, it is frequently too humid, and in summer, generally too dry. While the most healthful amount of vapor may be considered as about seventy degrees, the utmost saturation being one hundred degrees, the average here, during the dry season, is not more than about sixty degrees. On the other hand, in winter, one of the evils of want of ventilation is, that the air of our rooms becomes, unless properly heated, saturated to the utmost by the superadded moisture evolved from the lungs and skin of the inmates. Professor Tyndall found that the moisture alone, in the air of an ordinary room, absorbed from fifty to seventy times as much heat as the air does. Air and the elementary gases—oxygen, hydrogen and nitrogen—have no power of absorbing radiant heat, but the compound gases have a very different effect. Perfumes have a wonderful power of absorbing radiant heat. The moisture in the air, however, is of the greatest practical importance—like a soft, invisible blanket, constantly wrapped around us, it protects us from too sudden heating or too sudden cooling. Speaking of the moisture in the air, the same authority says: "Regarding the earth as the source of heat, no doubt at least ten per cent. of its heat is intercepted within ten feet of its surface. The removal of a single summer's night of the aqueous vapor from the atmosphere which covers England, would be attended by the destruction of every plant which a freezing temperature could kill. In Sahara, where the soil is fire and the wind flame, the refrigeration is painful to bear." In many of our furnace and stove-heated houses, we have an atmosphere in point of dryness equal to that of the desert, but more impure.

To rescue our rising generation from the direful effects of this culpable indifference on our part with regard to ventilation, and to retain for our country that acknowledged supremacy in all that pertains to our

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\* I have learned from Mr. Cook, that the intelligent School Commissioner had with the working of the system of ventilation adopted in the Jefferson school it to be introduced in the new school house in that locality.

common school system, should be the earnest endeavor of every patriotic citizen. Actuated by such considerations, let us look closer into this subject of ventilation, and see what means science and art have indicated, and human ingenuity may apply, by which, in our school houses as well as in our homes, our churches, our hospitals, and in all our public buildings, we can enjoy the vitally important luxury of pure air. While physiology, now happily taught in all our schools, demonstrates that the primary condition necessary for the preservation of organic force in an active state, or life, is an adequate supply of pure atmospheric air, your text books in natural philosophy also show that all-sufficient nature provides the most perfect means for accomplishing these requirements. Let us listen to the teachings of these text books. The atmosphere around us extends to the distance of forty-five miles from the surface, but with uniformly decreasing density, and thus forms a covering for the earth about one-one-hundred and sixtieth of its diameter. In becoming rarified, by the sun's heat, endless motion is produced therein, giving rise to winds, varying in force from the gentle zephyr to the destructive tornado. These movements of the atmosphere, which heat gives rise to, and the diffusive power of the air itself, tend to keep it constantly pure for the use of man. The sun's heat also raises water from the lakes and oceans, and steeps the air with moisture, which returns again to earth as refreshing rain. This aqueous vapor, which is mixed but not combined with the air, is essential to respiration, but if it be decreased or increased beyond the normal point, injury results. Of the physical properties of this aerial ocean, at the bottom of which man lives and moves and has his being, it is not necessary here to say much. They are chiefly negative, so that our senses do not readily perceive its presence—a circumstance which accounts for the negligence with which we treat it, taking no care that we shall aid nature in preserving its purity. That it is ponderable, is shown by the barometer and our wells; inasmuch as a column of air, one inch square, will weigh fifteen pounds, or will balance such a column of mercury thirty inches, in the first instance, and, in the latter, of water thirty-three feet high. Were it not for the pressure of this great superincumbent weight, which is unfelt by us, because of its diffusion, the air, which is thus forced through every crack and crevice, could never be made to renew itself in our houses. Concerning its chemical composition, I shall be almost equally as brief; reminding you that, while everything that can assume the gaseous form, may be found occasionally in the atmosphere, its chief component parts are oxygen, nitrogen, aqueous vapor and a very small proportion of carbonic acid. The specific gravity of this latter gas is considerably greater than that of air, and, were it not for the peculiar law of gaseous diffusion, would settle down to the bottom of the atmosphere, and form a layer five feet deep. But, if only the normal amount be present, it is completely diffused. In the human body, oxygen is the great motor power, but as its effects would be too stimulating, if pure, it is found diluted with four times its volume of nitrogen. Introduced, by breathing, into the air-cells of the lungs, which number five or six millions, it is seized by the red-cells of the blood, carried through every tissue to combine with its carbon and hydrogen, thereby producing combustion, and consuming the worn out molecules, under the direction and control of the vital principle, thus extricates heat. And as oxidation is the source of all the functions of the human body, it is concerned alike in such diverse acts as the contraction of our muscles and the production of thought. Having performed its office, the oxygen is found to have !

cent. and to have gained about an equal amount of carbonic acid in the expired air, which will also be found to be warmer and more moist, as one perceives of a frosty day, because of the condensation of the vapor. The carbon and hydrogen are now taken up by the leaves of the trees, which, entering into and becoming a part of the tree, the oxygen is returned to the atmosphere to repeat the process. This, then, is the office of respiration, to remove the worn out tissues of the body; while "the leaves are for the healing of the nations." Complete denial of oxygen, it would thus appear, must prove rapidly fatal, and a diminished supply injurious; but so perfect are Nature's provisions for affording an equable supply, that we do not meet with death or disease unless we interfere with her operations. Now art and civilization have induced conditions, which, to a greater or less extent, interfere with or antagonize the purely normal conditions.

To protect himself against the ever-recurring changes of the weather, man builds his house, and by living within its walls he to a certain extent disregards the laws of nature, for the air within the confined space is not as pure as that which surrounds it—his very breathing corrupting it. Again, in all the regions of the earth north of twenty-five degrees south latitude and south of twenty-five degrees north latitude, artificial heat becomes necessary, and in our latitude is required in our houses for half the year at least. Here, then, is another factor of the artificial condition, and one which to a greater or less extent vitiates the natural or normal state. If the fire be made to burn in an open fireplace, or in a close stove, a portion of the oxygen of the air is required to oxidize the fuel. Now, if the supply from without be sufficient both for respiration and combustion, little heat could be imparted to the room, because the supply must be of the same temperature as that of the air outside the house. On the other hand, if we cut off the full supply, the air in the house might be warmed but would be rendered impure—poisonous. "Few persons," says Professor Sewall,\* who has put the whole system of ventilation and warming I am about to recommend in such a clear and intelligible shape that I have adapted his reasoning, also, to my purposes, "few persons seem to understand just how a room is warmed. The air next to the burning fuel, in the case of the open fire, is heated, and for the most part goes up the chimney. A small part, however, arises into the room, and the cold air takes its place. The heated air, that rose slowly, cools and is displaced by the warmer and rarer air just escaped from immediate contact with the fire, and after a time falls and is again heated. So that we see only a small part of the air of the room is warmed, while whole oceans of it are heated and escape from the chimney. If a stove be used for heating, only a small part of the air comes in contact with the burning fuel; in fact, just enough to oxidize the fuel, while the air about it is heated and rarified and then pressed up by the cooler and heavier air, which is in turn heated and forced up, and thus we have a current of air established, moving towards the stove, then up to and along the ceiling, then down to be warmed again. But as this current takes place in a closed room, of course it is the same air moving in a circle, to which we are constantly imparting the carbonic acid of the breath." Now, besides this carbonic acid gas, and the warm moist air exhaled from the immense surface which our lungs present (nearly twenty square feet), to which I have already alluded, and which, together with the watery vapor given

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\* Illinois State Agricultural Transactions, Vol. 6.

off by "twenty-eight miles of perspiratory tube, terminating in seven millions of pores on the surface of the skin," has been variously estimated from twenty to forty ounces in twenty-four hours, or about six to twelve grains troy per minute, the room will be found also to contain animal matter, which seems to putrify almost immediately after being thrown into the air. This latter source of the vile odor in an ill-ventilated room, and in its effects on health, is far more dangerous than carbonic acid gas, which is now generally considered rather as an obstructor of respiration than as a positive poison.

The amount of carbonic acid in the air (and from breathing large quantities of which the workmen engaged in the manufacture of soda water do not experience any ill effects) is not a positive guide as to the amount of organic matter which accompanies it. Until Dr. R. Angus Smith, of England, applied himself to this point, we had no means of ascertaining it. A solution of the permanganate of potash loses color in contact with organic matter, to which it gives ozone or oxygen. Dr. Smith took measured quantities of air and added definite quantities of a solution of the permanganate, and the less this was decolorized the more free was the air of organic impurity. Whether this organic matter in the air be waste tissue, which has once had life and has now undergone metamorphosis incident to decay, or whether it be living organism, seed, germ, spore or vital radicle of any sort, the labors of neither the chemists nor the microscopists have yet been able to determine.

Still another element of evil must be counted in the minute fibrous and textile particles arising from carpets and mats, and in the school rooms from the clothing of the children, especially of the poorer classes, which is worn and kept in homes that have never known an airing. "It is easy," says a thoroughly educated architect,\* "to detect in some school rooms the odors resulting from the different occupations of the children's parents, mingled with the scent of the frying of the family doughnuts or the smoke of the paternal tobacco pipe."

Insignificant† as these things appear, it should nevertheless startle the most careless to know that the germ theory of disease, as popularly taught by such eminent men as Tyndall and Huxley, points to just such causes becoming efficient sources of vital derangement, by immediate

\* A. C. Martin, Second Annual Report of the State Board of Health, Mass.

† In illustration of the value of the determination of very small amounts of impurity in air, we quote the following remarks of Dr. R. Angus Smith, from a paper on "Chemical Climatology," in the *Scottish Meteorological Journal*, January, 1870:

"Some people will probably inquire why we should give so much attention to such minute quantities—between 20.980 and 20.999 of oxygen—thinking these small differences can in no way affect us. A little more or less oxygen might not affect us, but supposing its place occupied by hurtful matter, we must not look on the amount as too small. Subtracting 0.980 from 0.999 we have a difference of one hundred and ninety in a million. In a gallon of water there are seventy thousand grains; let us put into it an impurity at the rate of one hundred and ninety in a million; it amounts to 13.3 grains in a gallon. This amount would be considered enormous if it consisted of putrefying matter, or any organic matter usually found in waters, but we drink only a comparatively small quantity of water, and the whole thirteen grains would not be swallowed in a day, whereas we take into our lungs from one thousand to two thousand gallons of air daily. The detection of impurities in air is, therefore, of the utmost importance; and it is only by the finest methods that they can be ascertained in small quantities of air, even when present in such quantity as to prove deleterious to health. \* \* \* If, by inhalation, we took up at the rate of thirteen grains of unwholesome matter per day—half a grain per hour—we need not be surprised if it hurt us. Such an amount is an enormous dose of some poisons, and yet this is not above one two-thousandth part of a grain at every inhalation. It is marvellous what small amounts may affect us, even when, by repeated action, they do not cumulate as certain poisons do. The carbonic acid numbers might have been used for this illustration, instead of the oxygen numbers, with the same result."

access to the blood through respiration. Still, as we are not discussing diseases, it would be out of place here to enter into details of these hints which science gives of their prolific causes. We are discussing only the far simpler question, how we can best ventilate and warm our school rooms. To do this understandingly we have entered into a brief consideration of the circumambient air which nature so abundantly provides—its properties, physical and chemical—also of the physiology of respiration; and we have seen that, deprived of its normal proportion of oxygen, by the mere act of breathing in the school room, it is rendered unfit for the purposes of life.

I have shown that the carbonic acid, the watery vapor, the animal matter and the microscopic dust are intimately diffused throughout the confined air; and, more than this, an abnormal proportion of the former gas, with its greater specific gravity, ruling, the tendency of all these noxious matters is to settle with it to the bottom of the room, just where its occupants—both scholars and teachers—spend from five to six hours daily. The deterioration, thus sustained by the atmosphere, is further aggravated by the products of combustion evolved, and by the loss of oxygen consumed by artificial heating. All this, as we have seen, our children are subjected to, and we think little or nothing about it, because no direct or immediate effect may be revealed. Yet, when these children complain of headache, and every other kind of ache, as we too often know they do, or are stricken down with one of those *zymotic* maladies, and of these we instance typhoid fever, scarlatina or measles, whose propagation depends upon the presence of fermentible matter in the blood, we gravely wonder at the cause—conjecturing every other but the right one. Numerous are the cases I could cite in which not only disease, but speedy death of a number of persons confined together have resulted from the neglect of the most ordinary precautions for supplying them with air. As it is not possible to find, in the pages of history, a stronger or more striking corroboration of the truth of this principle, than in the awful results of the atrociously wilful immurement in the Black-hole of Calcutta, twenty-first June, seventeen hundred and fifty-six, of one hundred and forty-six prisoners, by the Soubahdar of Bengal and other provinces, I will here adduce an authentic account of the same, at the risk of its being tiresome to some of you from familiarity. The narrative\* states that:

“It was about eight o’clock when these unhappy persons, exhausted by continued action and fatigue [and several suffering from the effects of recent wounds†], were crammed together into a dungeon about eighteen feet square [eighteen by fourteen‡], in a close sultry night [in the sultriest season of the year§], in Bengal; shut up to the east and south, the only quarters whence the wind could reach them, by dead walls, and by a wall and door to the north; open only to the west by two [small||] windows strongly barred with iron, from which they could receive scarce any circulation of fresh air [an evil aggravated by the overhanging of a low verandah¶]. They had been but a few moments confined before

\* John Z. Holwell, *India Tracts*, p. 392, as quoted by James H. Pickford, M. D., in his *Hygiene on Health*. London, 1848.

† *History of the British Empire in India*, by Edward Thornton, London. Vol. I, p. 193.

‡ Cooke’s evidence in first report of Select Committee of House of Commons.

§ Thornton, *op. cit.* Vol. I, p. 193.

|| *Ibid.*

¶ Thornton, *op. cit.* Vol. I, p. 193.

every one fell into a perspiration so profuse that no idea can be formed of it. This brought on a raging thirst, which increased in proportion as the body was drained of its moisture. Various expedients were thought of to give more room and air. Every man was stripped and every hat put in motion. They several times sat down on their hams, but at each time several of the poor creatures fell and were instantly suffocated or trodden to death. Before nine o'clock every man's thirst grew intolerable and respiration difficult. Efforts were again made to force the door, but still in vain. Many insults were used to provoke the guards to fire upon the prisoners, who grew outrageous, and many of them delirious. 'Water, water!' became the general cry. Some water was brought; but these supplies, like sprinkling water on fire, only served to raise and feed the flames. The confusion became general and horrid, from the cries and ravings for water, and some were trampled to death. This scene of misery proved entertainment to the brutal wretches without, who supplied them with water that they might have the satisfaction of seeing them fight for it, as they phrased it; and held up lights to the bars, that they might lose no part of the inhuman diversion. Before eleven o'clock most of the gentlemen were dead, and one-third of the whole. Thirst grew intolerable; but Mr. Holwell kept his mouth moist by sucking the perspiration out of his shirtsleeves and catching the drops as they fell like heavy rain from his head and face. By half an hour after eleven most of the living were in an outrageous delirium. They found that water heightened their uneasiness, and 'Air, air!' was the general cry. Every insult that could be devised against the guard, all the opprobrious names that the viceroy and his officers could be loaded with, were repeated, to provoke the guard to fire upon them. Every man had eager hopes of meeting the first shot. Then a general prayer arose to Heaven to hasten the approach of the flames to the right and left of them, and put a period to their misery. Some expired on others, while a steam arose, as well from the living as the dead, which was very offensive. About two o'clock in the morning they crowded so much to the windows that many died standing, unable to fall by the throng and equal pressure around. When the day broke the stench arising from the dead bodies was insufferable. At that juncture the Soubahdar, who had received an account of the havoc death had made among them, sent one of his officers to inquire if the Chief survived. Mr. Holwell\* was shown to him, and it was near six when an order came for their release. Thus they had remained in this infernal prison from eight at night until six in the morning, when the poor remains of one hundred and forty-six souls, being only twenty-three, came out alive, but most of them in a high putrid fever."

Such, then, are the frightful consequences of overcrowding together in a limited space, without free ventilation, a large number of human beings exposed to the poison of their own contaminations, carbonic acid gas and the secretions from the skin and pulmonary mucous surfaces. Per contra, I will now briefly refer to two instances only, out of the many that might be adduced, of the beneficial effects of ventilation in the saving of human life from disease and death: "During the twenty-five years following seventeen hundred and fifty-eight, when the Rotundo Lying-in Hospital was founded, seventeen thousand six hundred and fifty

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\* Who was a member of Council, and assumed the command of the fort at Calcutta, on the ignominious flight of the Governor, Mr. Drake, and the commandant, Captain Minchir

infants were born alive; two thousand nine hundred and forty-four of them died, or about one in six. The hospital, which up to this time was unventilated, was altered so as to allow a free supply of air; and for the following twenty-five years, but five hundred and fifty out of fifty-seven thousand and seventy-two died, one in one hundred and four—a mortality seventeen times less!" \*

Again, from the very full and careful statistics prepared by the Surgeon-General of the armies of India, I find the mortality from cholera varied as the provision for ventilation varied. Every other circumstance being the same, the mortality, where the provision for respiration was good, amounted to fifteen in one thousand; where it was very bad, it amounted to one hundred and eight in one thousand. Not only, then, does theory teach us that imperfect respiration induces disease, but also these realities demonstrate the same truth. True, the effects of bad ventilation may not exhibit themselves in the form of cholera or putrid fever, but they must and do manifest themselves in some other way, in slower diseased processes.

With such facts confronting us, we are forced to conclude, from the nature of the evils attending the want of ventilation, that no system can be successful which does not insure the full and complete renewal of air as soon as it becomes foul. How to do this in all weather, without creating offensive and dangerous draughts, or excessive heat, is a problem of no ordinary difficulty. Its solution does not properly belong to the medical profession, but needs the knowledge and skill of the engineer and the architect. A higher order of intellect and a more thorough education than generally obtain, are the necessary requirements for the full comprehension of all the points bearing upon the subject. How few seem to realize what air is—that a very small bulk of it weighs a ton, and that it exerts a positive power of some kind to move a ton of air, as well as a ton of water; and that to move it artificially through artificially constructed houses, they must apply sufficient force to overcome the great natural laws of motion.

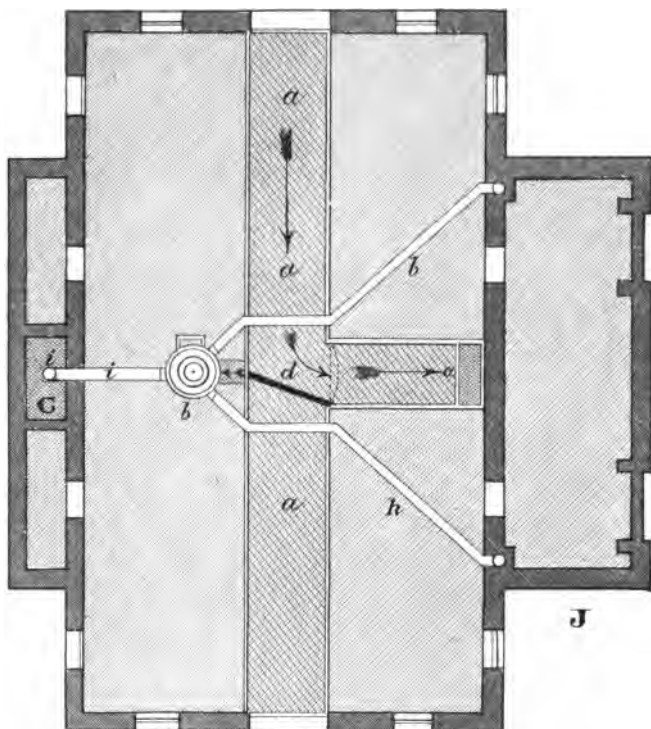
We have seen that Nature's provisions for the removal of the foul air, after the production of combustion, and the extrication of heat, are the most perfect and plainly beneficent of her wondrous works. In the construction of means, therefore, for the exit of air which has been breathed, we have but to copy after her. We might also derive benefit from the study of the equally interesting and instructive devices which even the instinct of a lower order of animals leads them to adopt for like purposes. For example, let me instance the operations of the bees to whom the work of ventilating the hive has been intrusted. The air can only enter at the door, as all the rest of the hive is plastered with propolis, a waxy matter with which the bees make their hives air tight. There are gangs of from ten to twenty working bees each, according to the heat of the weather, stationed at the entrance, who ventilate the hive by vibrating their wings with great rapidity, and each gang is relieved when on duty about half an hour. If a greater need for air be excited, as when they are roused by shaking the hive or letting into it some disagreeable vapor, the number of ventilators, and the efforts of each, are greatly augmented. So thus we see, throughout all animated nature, the instinctive and imperious demand for pure air, and that without the constant circulation of the atmosphere, the movements

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\* Lectures on Public Health; by E. D. Mapother, M. D. London, 1867.





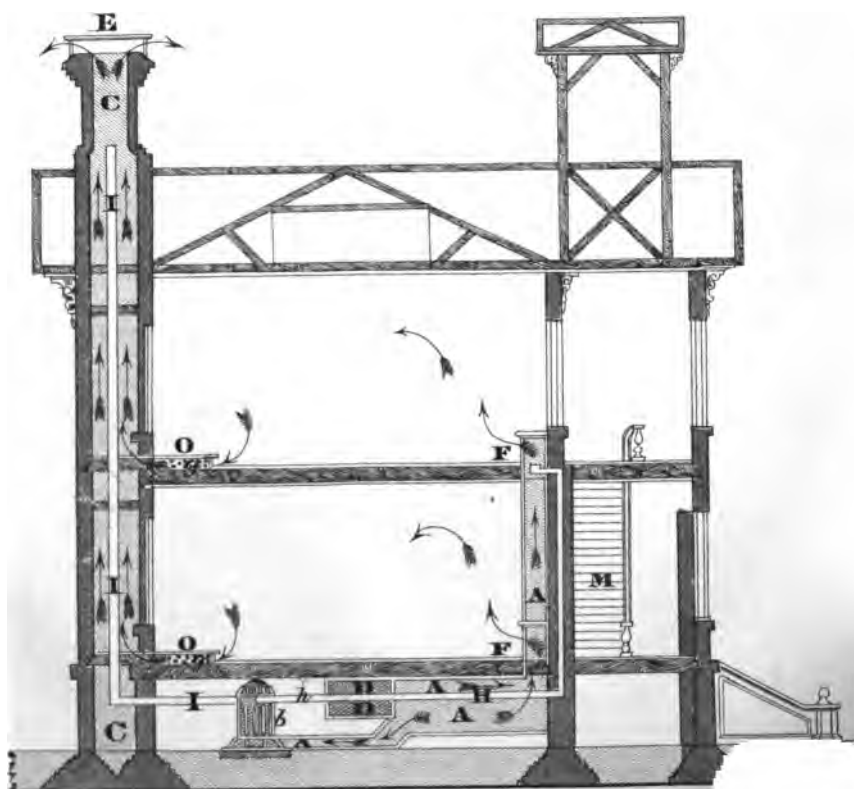
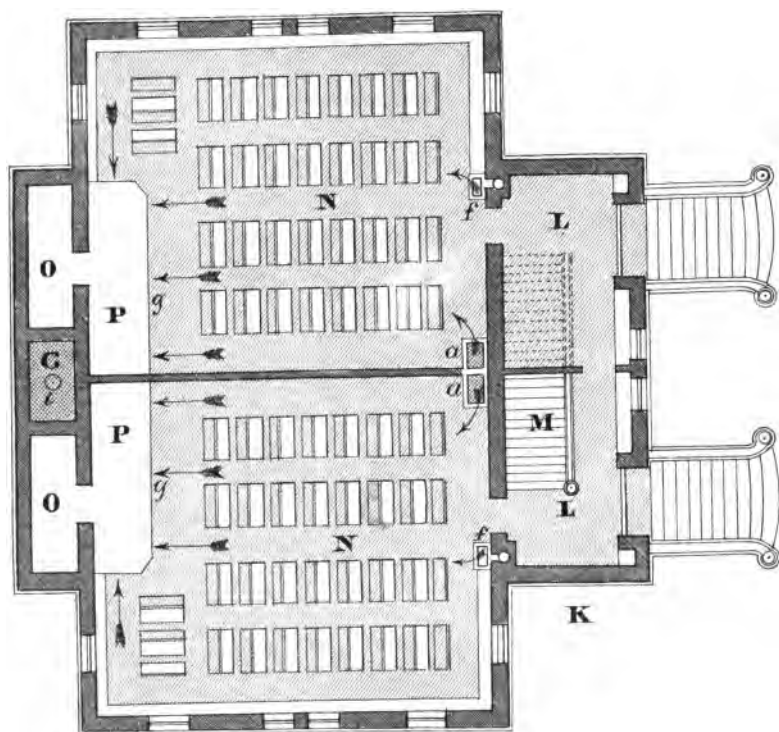


### REFERENCE TO SECTION.

- Aa.** Cold Air Duct.  
**Bb.** Air Warmer.  
**Cc.** Chimney's Exhaust Shaft.  
**Dd.** Door to guide the Fresh Air to each Room.  
**E.** Emerson's Ventilating Cap.  
**Ff.** Floor Register for Warm Air.  
**g.** Open base under platform through which Cool Air passes to exhaust Shaft.  
**Hh.** Hot Air pipe.  
**Ii.** Smoke Pipe.

### REFERENCE TO PLANS.

- J.** Basement Plan with cold Air, Ducts & Air warmer.  
**K.** First Floor Plan.  
**Ll.** Ante Rooms.  
**Mm.** Stairs to second Story.  
**Nn.** School Rooms.  
**Oo.** Teachers Closets.  
**Pp.** Teachers Platforms.



TRANSVERSE SECTION OF JEFFERSON SCHOOL



which heat and the attendant cosmical forces give rise to, there would be no life—all would be silence—

“in the void world—  
The wide, grey, lampless, deep, unpeopled world.”

The endless harmonies of natural objects around us, from the deep bass of the swelling ocean to the cheerful chirping of the cricket on the hearth, entrancing music and articulate speech, could have no existence. Stagnation is death! In the accomplishment, then, of the end in view, it would seem that there are two necessary essentials: first, pure air must be supplied in sufficient quantities; second, the foul or impure air must be removed. It is quite impossible to do one of these without doing the other. Air cannot be introduced into a room already filled with air, nor can it be removed from a room without admitting something to take its place. These simple principles, as I have already stated, are those advocated by Professor Sewall, and on which the Rut-tan system of ventilation and warming is based. Here are the conditions, which can be more readily understood by referring to the accompanying plans:

Cold air is admitted in abundance, through ducts, from the open air to the “air-warmer,” (Bb) where it is *warmed* (not heated *red-hot*, and its life-sustaining qualities vitiated\*); thence, it rises and is diffused through the room or rooms, either by means of air ducts (Hh) or transoms, near the ceiling or over the doors, while the vitiated cold air in the room, being heavier, falls to the floor and escaping at or near the bottom of the room, passes beneath the floor (Gg) and is collected into the foul air shaft, and returns into the still colder outer air. The plan is to take the air into one central apartment, usually the hall, through the “air-warmer,” and then allow it to circulate, as just indicated, by means of natural laws, requiring no machinery other than simple ducts. It is the *vacuum* method. It avails itself of the natural tendency of warm air to rise, which is the result of the law of the dilation of gases. By this arrangement we avoid all currents of cold air *over the floor*, chilling the feet, as in the case with stoves, and keep the floor always warm, varying only some four or five degrees from the temperature at—say *five feet* above the floor, while, in any ordinary room, warmed in the ordinary way, the thermometer will show a difference often of thirty degrees. In a room thus ventilated the air cannot be impure, because, as I have before stated, the carbonic acid exhaled from the lungs, being heavier, falls to the lower part of the room and escapes, while pure air from without takes its place.

Here, then, we have a perfect system of ventilation. We secure a complete supply of pure, warmed air, but without strong currents being established, and this without admitting dust,† flies, or mosquitoes, which is a most important consideration, while the impure air flows out continually; it being well understood that, to secure the proper working of

\* In the session of the French Academy, in 1868, Daville & Troost mentioned the fact that different species of gas, particularly carbonic oxide, will penetrate red-hot iron, which, they say, frequently occurs where there are iron stoves. Dr. Oldtman, in a pamphlet published on this subject, in the same year, does not hesitate to consider the chronic poisoning of school children, by carbonic oxide, as of frequent occurrence.

† Professor Tyndall, with his electric sunbeam, and still more electric genius, has shown that the motes of the sunbeam, with which every child has played, too often represent the *sewage* of the air, the danger of which, in its analogue in water, the doctors have long been instilling into the unwilling minds of the public.

this system of ventilation, the windows and doors must be kept closed, and wire gauze placed over the inlets for the outer pure air. Another great advantage gained by this plan is the *equality of the temperature of the air*. Actual experiment shows that there is not more than five degrees difference between the temperature at the ceiling and at the floor, while in a room warmed by a stove the difference is from twenty to forty-five degrees Fahrenheit. In summer, the air is cooled by placing either ice or wet cloths within (Aa) cold-air ducts, and which, by producing abundant evaporation, cool the air, while supplying the proper degree of watery vapor. If there is the least breeze stirring, the system will work automatically in summer, without the applied force of fire. If no air whatever is stirring, a reaction can be produced by placing either a burner, or an oil-lamp, or a dumb stove in the exhaustion shaft. The plan of passing the foul air out, at or near the floor, is emphatically new. It is an idea which has completely revolutionized the old systems of ventilation, which looked to the upper flues or ventilators, erroneously, for the escape of impure air. The purest and warmest air is always at the top of a room, while the coldest and most impure is always at the bottom.\*

It would thus seem that it is not difficult to determine which of the two plans is the sensible or the true one. Nor does it appear necessary to claim more for the system advocated, than, as I am informed by those practically acquainted with the working of it in the Jefferson School-house, of Sacramento, that it is cheapest, best of all, and gives what is most needed—a full, complete, and constant supply of pure air. The plans which I have presented, and which have been drawn by Mr. Cook, expressly for my report to the State Legislature (in which they will be published with this lecture), will explain at a glance the whole construction and apparatus of the system of heating and ventilation I have been discussing. While it is undoubtedly true that it can be most effectually introduced into buildings during the process of construction, yet I am informed that it is not very difficult to rearrange, and adapt the system to those already built. We can, therefore, have our school houses fitted for this system, be they old or new, nor should we rest content until all our pupils, as well as teachers, are thus secured the breathing

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\* Since writing the above, the valuable work on ventilation by L. W. Leeds has fallen into my hands, and from which the colored plate, representing "Imperfect Ventilation" (Fig. 1), and "Perfect Ventilation" (Fig. 2), is taken. The whole problem is thus demonstrated in so beautiful and simple a manner that, on looking at it, we naturally exclaim, how came any one ever to think of anything else! "It is very important, for a clear understanding of this subject to remember," says this author, "that the foregoing [demonstrations] refer *only* to cases where rooms are heated exclusively by introducing currents of warmed air which has been heated outside of the room. But one-half of our rooms are not heated in this manner—they are warmed by heaters immediately in the room, such as the common stove, the open fire, steam radiators, living beings, gas-lights, etc. And, then, the conditions are very different, requiring an entirely different study and treatment. The fresh air generally comes in colder, when thus warmed in the room, and consequently falls to the floor, and flows underneath the fouler and hotter air that has been longer in the room. We are also apt to be much deceived by opening a window at the top, thinking the warmed air will go out there, or, if cold air should come in, it would be at the top of the room, and consequently do no harm; whereas, it not unfrequently falls, like a torrent, directly to the floor, keeping the feet cold while the head is hot, and little children may suffer much with cold, in this way, while the [teacher's] head or a thermometer hanging above the fireplace may indicate a high temperature. So, you see, we must first determine the *relative* temperature of the air entering the room, as that, of course, must be considered fresher than air that has been longer in the room; if that is warmer than the air in the room, then there should be openings provided for the escape of the fouler air from the bottom of the room. If, on the other hand, the air entering the room is colder than the air longer in the room, then there should be an opening for the escape of foul air from the top of the room. All windows should be made to lower from the top, as they are the great natural ventilators, and are especially useful all summer, and always at night the whole year."

## IMPERFECT VENTILATION.

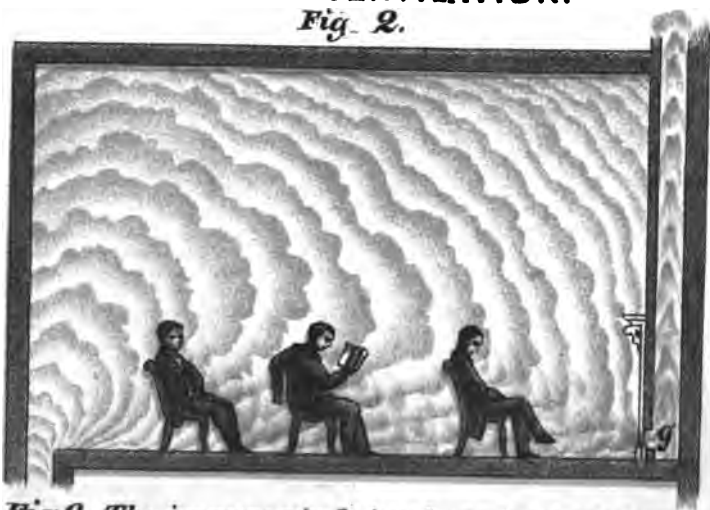
*Fig-1.*



*Fig.1. The waves of pure air are seen entering, ascending & passing directly out at the opening near the ceiling C into the exhaustion shaft.*

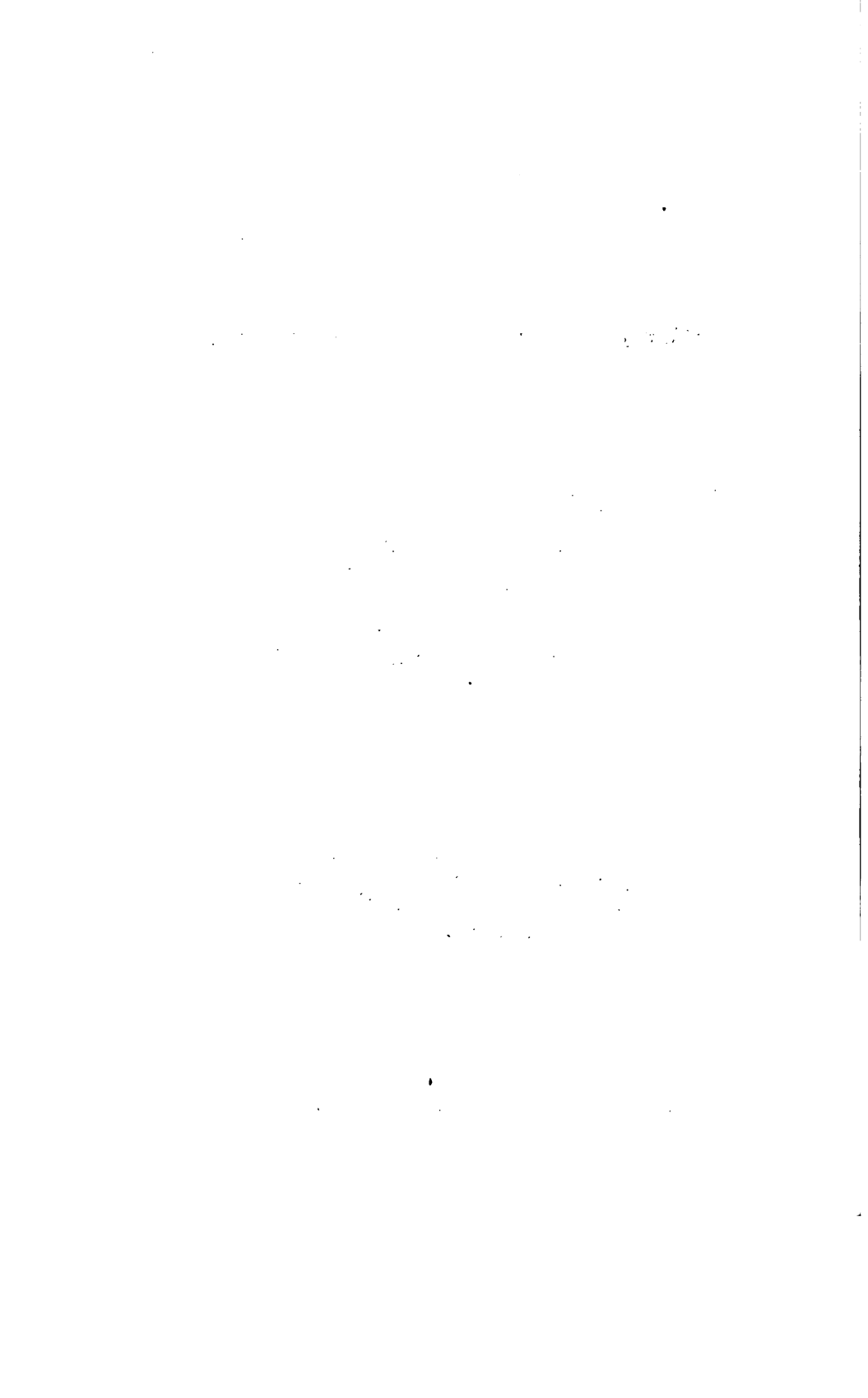
## PERFECT VENTILATION.

*Fig- 2.*



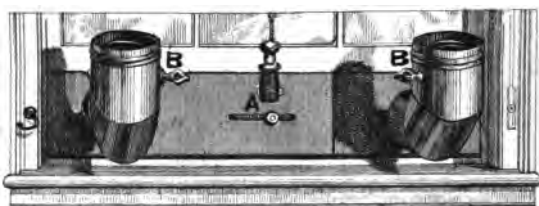
*Fig.2. The impure air, being heavier, passes out, as soon as created, at the opening in the base of the chimney for exhaustion shaft.*







## PORTABLE WINDOW VENTILATOR



**VENTILATOR IN WORKING POSITION.**



**VENTILATOR NOT IN ACTION**

*A Set screw, to secure the two halves of Ventilator.*  
*BB Dampers to regulate the admission of Air.*

of pure air. Still, where this expense cannot be borne, I have here a specimen of a "Portable Window Ventilator," patented by W. B. Maine & Co., of Boston, which affords the next best method for ventilating rooms, especially where stoves are used for heating. You will see, from the drawing, that this simple and efficient device can be put in position in a moment, and removed as quickly, without the least alteration of the window. Dampers or valves are also provided to regulate the quantity of air admitted, or to stop it off entirely, at any moment, without removing the ventilator from the window.

To adjust the ventilator, take the half with the slit in the end, and lay it upon your knees, with the tube upon the right side. Next place upon it the other half, with the tube to the left. Secure the two halves together with the set screw, and then turn the tubes in a horizontal line with the mouth or opening upwards. Next raise the window, and set it on the window sill. Now extend it, so that the ends will press hard against the jams of the window, and turn the set screw as tight as you can, so as to secure the boards together. Finally raise the little button upon the back of the board, draw the window down upon the board, and inside of the button, which will keep it from tipping, and open both dampers. The flow of air will depend upon the difference of temperature within and without the room. If the temperature outside is thirty-two degrees, and that within seventy degrees, the flow will be much greater than when the two temperatures more nearly approximate. Should it be desirable to guard against flies, mosquitoes, dust, or malaria, a piece of pasteboard must be tacked on the top of the elevated lower sash, after being properly fitted, and the caps or rings covered with gauze, placed upon the air tubes. All this being done, set the vaporizing pans, with a flat sponge, in each of the outer openings, and saturate them with water, if only the humidity is to be corrected; but if the air in the room contains organic or putrescent matter, then put in the pans any desired disinfectant. A mixture of equal parts of permanganate of potash, sulphate of iron, carbolic acid and camphor will answer well for this purpose. A refreshing perfume can be diffused over the room by saturating the sponges with a mixture of cologne and water. If the room is supplied with exhaust flues, and registers near the floor, the vitiated air will be much sooner removed.

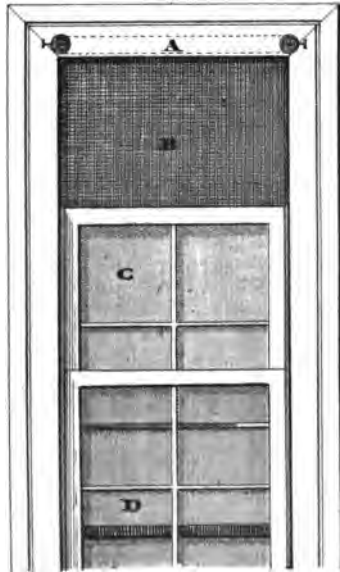
There are several advantages connected with the portable window ventilator, to which I will briefly allude. In the first place, the height of an ordinary window from the floor is the proper place to admit air, provided it can be done without draughts or currents of air. This is done successfully by this device, in changing the column of air which enters the room in a horizontal line to a vertical column. Secondly, cold air should neither be taken in at the top nor at the bottom of a room. If taken in at the top, on horizontal lines, the air in the middle or lower part of the room is not materially benefited. While, if taken in at the bottom, it gives motion to the gases and heavier impurities, which settle to or near the floor. Thirdly, the shortest possible distance is obtained for the air to travel, from the time it leaves nature's great reservoir until used for respiration. In cold weather, of course, this necessitates the use of a stove, or some such means of warming the room, and, on this account, the window ventilator is objectionable, if not altogether unavailable; for in a school room of capacity for forty scholars, there should be at least four of these ventilators used, to have the full effect desired. It is not claimed that the portable window ventilator can materially change the temperature of a room by day, in the

heat of summer, yet if placed in the window at night, it will, without draught or current of air, remove the heated and vitiated air from the room, and this the more readily if there is an exit left for it, supplying its place with the cool air of the night; a most important change for all rooms—school, sleeping or sick rooms. There is an agent appointed in this State for the manufacture and sale of this portable ventilator, and to him I refer you for further particulars. The cost is a mere trifle, and in comparison to the good to be gained, absolutely nothing.

Permit me to call your attention to an explanatory drawing of another invention which affords a most simple means of obtaining ventilation without admitting dust or draught—two very important considerations in our State, where, during the dry season, the former is intolerable, and the latter becomes the prolific source of neuralgia, paralysis, and the cause excitant of most of our diseases. The invention is an improvement of my own, on one of a somewhat similar construction, which has been patented recently in England and is now much in vogue there. Our ventilator consists of an open canvas fabric, such as is used for embroidery, which may be coated over with a solution of gum elastic, in order to make it withstand, the better, atmospheric action, attached to a roller, sunk in the adjacent framework above the sash, to which latter it is also attached, and which coils and uncoils as the sash is raised or lowered, on the principle of the ordinary carriage curtain, by means of a spiral spring. This ventilator is self-acting, capable of readily regulating the quantity of air to be introduced, can be easily attached or detached, and when not in use is out of sight. A narrow groove about the fourth of an inch deep on each side of the window frame, parallel with the sash pulley cord, for the running of the gauze, will make a complete adjustment. The ventilator can also be fitted to the outside or inside of any ordinary sash, but this will not make so neat a finish or so fully answer all the purposes for which it is intended. Although simple and inexpensive, it is nevertheless constructed on strictly scientific principles. To illustrate: Hold the open palm of the hand at the back of an ordinary gauze screen or wire sieve, and blow sharply through the same from the mouth, when no draught will be felt. For this reason it may be kept in use with safety in sick rooms and sleeping apartments, where a constant supply of fresh air is most required. It acts like the watering pot on the rose. If water be poured on a tender plant through a spout, the current by its force beats down and destroys it; but it is rendered harmless by being broken into a number of minute streams and imperceptibly diffused. The Davy lamp, the shower bath and the respirator—in fact, the hair in the human nostril—are all further illustrations of the same principle. The gauze also deprives humid air, especially at night, which transports malaria, of its noxious material in a great measure, while passing through it.

Windows are made to open, but are generally kept shut. Why? Simply because the inmates are afraid to open them on account of dust, flies and currents of air. There is no reason why every window should not be made a natural ventilator, and by this means they readily become so. Reverse the drawing and it will be seen that the same invention can be readily adapted to the lower sash. There being no danger from draught, both sashes may then be *always kept open*, much or little, according to the state of the temperature of the room—which should be kept as possible to a uniform degree; and for this reason no school should be without a thermometer, which should be hung on the outside. It must be borne in mind, and cannot be too well remem-

## SELF-ACTING GAUZE-VENTILATOR

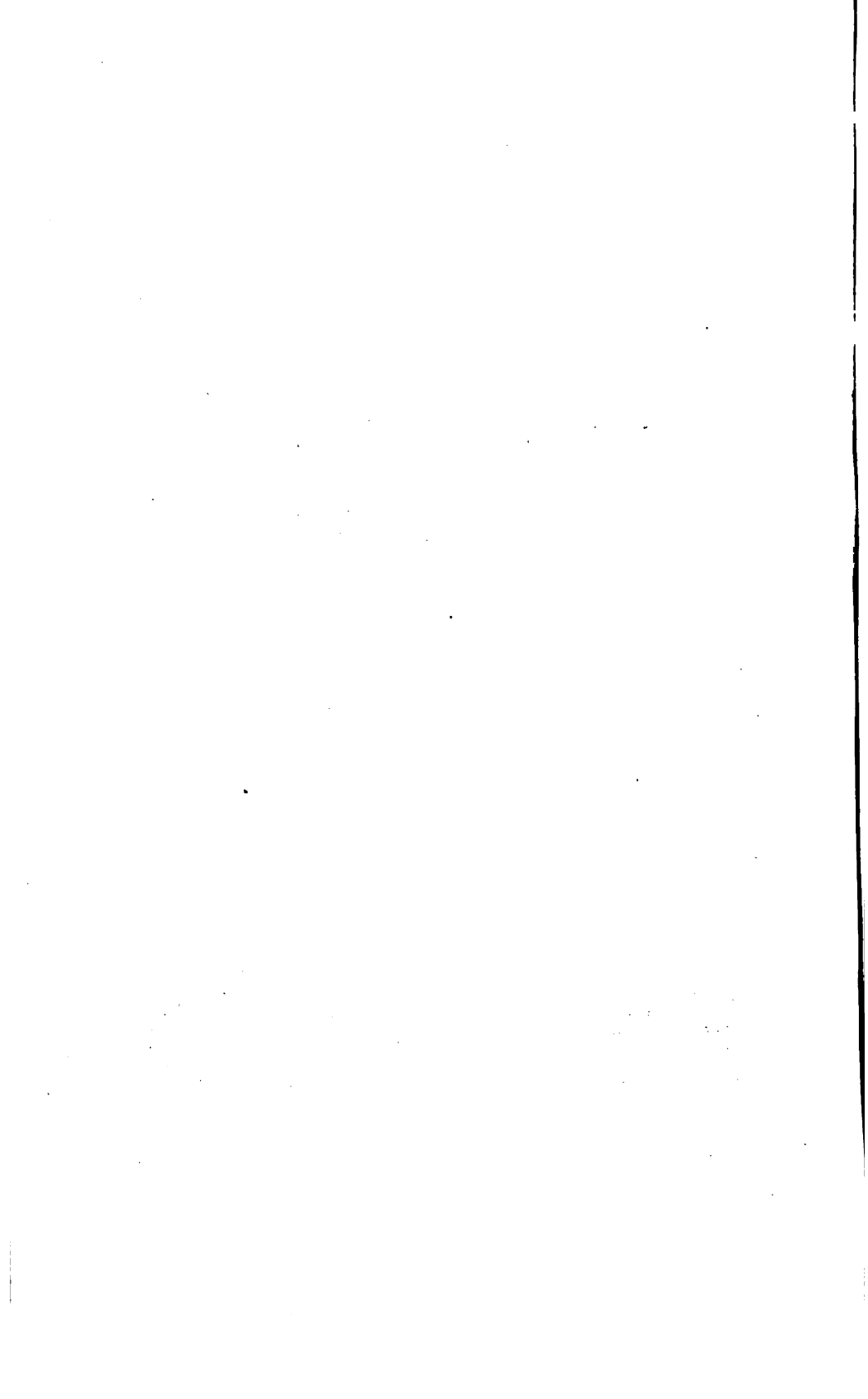


INTERIOR ELEVATION OF WINDOW, SHOWING THE VENTILATOR **B** IN ACTION.

*The dotted lines denote the Cylinder **A** with the spiral springs at each end, which are to be sunk in a recess within the frame of the sash, & of course are to be out of sight.*

***C** is the upper sash partly lowered. **D** the lower sash in place.*

*A narrow groove about a quarter of an inch deep on each side of the window frame, parallel with the sash pulley cord, for the running of the gauge, makes the adjustment complete.*



bered, that as the ventilation is by this method continuous, two inches at the top of one of the upper and two inches at the bottom of another of the lower sashes, will be sufficient to well ventilate ordinary rooms when the temperature of the air is in the neighborhood of sixty degrees, our mean annual temperature.

Every keeper of a green house regulates its heat by a thermometer. Why should we not apply the same measure of wisdom to the human plant as to that of the vegetable? A temperature as near to from sixty degrees to sixty-five degrees as possible, is about the proper one for an average number of healthy children in a school room, where it is supposed they are kept quietly seated. When exercising in the open air we can undergo a fall in the mercury of twenty or thirty degrees without danger; but such a transition, to one engaged in sedentary occupations, becomes painful, if not perilous. The thermometer, however, ceases to be a guide, except in pure air. When the air enters the lungs, its oxygen evolves heat by a process similar to combustion. This is the reason why our bodies are always warm and the blood remains steadily at a temperature of about ninety-eight degrees in the healthy adult—irrespective of the high or low range of the external atmosphere; and it is only through the agency of its oxygen in the purification of the blood that this heat is supplied. Now, a thermometer indicates the same degree of heat in that portion of the air (azote) which is deprived of its oxygen as in ordinary air, and therefore is only to be relied upon as a measure of the temperature, not the purity of the air.

In the wide range afforded by the enlarged view I have taken of the subject in hand, there are many other points to which I desire to call attention, but the limits of a single lecture preclude further discussion. I allude more especially to the ground and internal plans of the school house to suit the different grades of tuition, the fullest amplitude of space and height of ceiling, the proper provision of stairways (two at least to each floor, affording ample means for egress in case of fire), and the proper construction of the school furniture, etc., all of which, although apparently of secondary consideration, are far from being unimportant in their correlative relations. The carrying out of these, as well as other details, I must leave to the intelligent and philanthropic friends of education, whose minds I have endeavored to turn in the right direction.

In endeavoring to illustrate and give a reason for the principles which underlie all that has been advanced, I have entered into digressions which, although they may have appeared at first glance irrelevant, will, I trust, strike you when isomerically reviewed and considered, as affording a philosophic and more comprehensive grasp of the whole subject—at each turn opening up a wider horizon, and expanding the mind to conceive in all its harmonious proportions the ideal perspective of a complete academic structure, worthy at once of the great State of our adoption and of being consecrated and deeded to the health-giving daughter of Æsculapius, in trust for the children of California.

# THIS DRAFT OF AN ACT

RELATING TO A REGISTRY AND RETURN OF BIRTHS, MARRIAGES AND DEATHS, AND FOR ESTABLISHING LOCAL BOARDS OF HEALTH, AND FOR OTHER SANITARY PURPOSES, HAS BEEN PRESENTED TO THE REVISION COMMISSIONERS, AND WE FEEL ASSURED THAT ITS PRINCIPLES WILL BE EMBODIED IN THE POLITICAL CODE.

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WHEREAS, It is expedient that further and more effectual provision should be made for ascertaining and improving the sanitary condition of the State and of populous places; therefore,

*The People of the State of California, represented in Senate and Assembly, do enact as follows:*

SECTION 1. The County Recorders of the several counties of this State shall, annually, in the month of June, transmit to the Secretary of the State Board of Health a certified copy of their record of births, marriages and deaths which have occurred in their respective counties during the year next preceding the first day of January. The births shall be numbered and recorded in the order in which they are received by the Recorder. The record of births shall state, in separate columns, the date of the birth, the name of the child (if it have any), the sex of the child, the place of birth, name and surname of one or both the parents, residence of the parents, occupation of the father, and the time when the record was made. The marriages shall be numbered and recorded in the order in which they are received by the Recorder. The record of marriages shall state, in separate columns, the date and place of marriage, the name and surname of the groom and bride, the residence of each at the time of marriage, the age of each, occupation of the man, and time when the record was made. The deaths shall be numbered and recorded in the order in which they are received by the Recorder. The record of deaths shall state, in separate columns, the date of the death, the name and surname of the deceased, the sex, condition (whether married or single), age, in years, months and days, the place of death, the disease or apparent cause of death, the occupation, if a male over fifteen years of age, the place of birth, the name of the parents, and the time when the record was made.

Sec. 2. The County Assessors in the several counties shall, annually, in the month of February, ascertain, from actual inquiry or otherwise, all the births and deaths which have happened in their several school

districts during the year next preceding the first day of January, together with such facts concerning said births and deaths as are required by the first section of this Act, and shall make an accurate return thereof to the County Recorder, in which such school district is situated, on or before the first day of March; and said Assessor, or other person or persons authorized to perform his duties and make such returns, shall be entitled to receive from the county treasury of such county twenty-five cents for each and every birth and death so returned. And every person aforesaid, who shall neglect or refuse to make the returns required by this section, shall be liable to a fine of not less than one hundred dollars for each neglect or refusal.

SEC. 3. Every Justice of the Peace or minister shall make a record of each marriage solemnized before him, together with all the facts relating to marriages required by the first section of this Act, and such Justice or minister shall, annually, in the month of February, or from time to time, return a copy of the record for the next year preceding the first of January to the County Recorder of the county in which the marriage was solemnized; and every person aforesaid who shall neglect or refuse to make the returns required by this section shall be liable to a fine of not less than one hundred dollars for each neglect or refusal.

SEC. 4. The County Recorder of each county shall be entitled to receive, from the treasury of the county, fifty cents for filing and recording each birth, death and marriage, provided the Recorder shall comply with the provisions of this Act in all respects.

SEC. 5. It shall be the duty of the Clerks of the several Boards of Supervisors of each county to make such distribution of the blank forms of returns as shall be designated by the Secretary of the State Board of Health.

SEC. 6. The Secretary of the State Board of Health shall prepare and furnish to the Clerks of the several Boards of Supervisors of each county, a model for blank forms, of suitable quality and size, to be used as books of records, according to the provisions of this Act, and also blank forms of returns, as hereinbefore specified, and shall accompany the same with such instructions and explanations as may be necessary and useful.

SEC. 7. Every physician, who shall attend any deceased person, shall sign a certificate containing the name of the disease or cause (if known) of the said death, when called upon for the same, by the undertaker in charge of the burial. Any such medical attendant who shall neglect or refuse to give the certificate required by this section shall, for such offence, pay a fine of one hundred dollars, for the use of the town where such offence shall be committed.

SEC. 8. It shall be the duty of the Secretary of the State Board of Health to receive the returns made in pursuance of the first section of this Act, and, with such assistance as may be voluntarily rendered by any authorized committee appointed by the Medical Society of the State of California for that purpose, prepare therefrom such tabular results as will render them of practical utility, and make a report thereof, biennially, to the Legislature, and, generally, shall do whatever may be required to carry into effect the provisions of this Act.

SEC. 9. The corporate authorities of the various cities and towns of this State are hereby required to establish Local Boards of Health, for promoting the sanitary condition of the said cities and towns, which said Boards of Health shall be subsidiary to the State Board of Health, and the members of which shall possess the same qualifications required by the United States medical service in the army and navy, to be chosen



by the corporate authorities annually, and be amenable to them and removable by them at any time for cause; and they are hereby constituted the Local Board of Health, with all the powers and privileges usually invested in Boards of Health, and with such further especial powers as may be conferred by the provisions of this Act.

SEC. 10. The State Board of Health shall have a general supervisory power over said Local Boards of Health; regulating the forms of certificates of births, deaths and marriages, and the manner in which they are to be made and reported to said State Board of Health, weekly, monthly and annually.

SEC. 11. And said Local Board, or its authorized agents, shall have the right at all times to enter into or upon any premises, for the purposes of this Act, and also to call upon any of the officers or of the police to aid them in the execution of its provisions.

#### SEWERAGE.

SEC. 12. The said Local Boards of Health may, if they shall think fit, cause to be prepared, or procure a map, exhibiting a system of sewerage for effectually draining their district for the purpose of this Act, upon a scale to be prescribed by the State Board of Health; and every such map shall be kept at the office of the said Local Board, and shall, at all reasonable times, be open to the inspection of the taxpayers of the district to which it applies.

SEC. 13. All sewers, drains or waste pipes, whether at present existing, or which shall be hereafter constructed, shall be entirely under the management and control of the Board of Health.

SEC. 14. The Board of Health shall cause their district to be effectually drained upon the following plan, and they shall have power within such district from time to time to do any of the following things:

*First*—To repair, arch over, enlarge, lessen, or otherwise alter any existing sewer or drain.

*Second*—To construct any new sewer or drain, with a like power of repairing and altering the same.

*Third*—To discontinue, close up or destroy any sewer or drain.

*Fourth*—To carry any sewer, drain or pipe, for the distribution of sewage, through, across or under any turnpike or other road, or county bridge, or any street, or place laid out as or intended for a street, or under any cellar or vault which may be under the pavement or carriage way of any street or intended street, upon condition of making good all damage done by them; or, if it is deemed necessary by the Surveyor of the Board, into, under or through any lands whatever, upon making due compensation for the same;

Subject, nevertheless, to the restrictions hereinafter mentioned; that is to say—

*First*—All waste pipes, sewers and drains shall be so constructed and kept as not to create a nuisance, or be injurious to health.

*Second*—If, by the exercise of any of the above powers, any person is deprived of the lawful use of any sewer or drain, the Board shall provide for his use some other sewer or drain equally convenient.

SEC. 15. No person shall, without the consent of the Board of Health, do the following things, or any of them:

*First*—Cause any waste pipe, sewer or drain to communicate with, or tied into, any sewer of the Board of Health.

—Cause any vault, arch or cellar to be newly built or con-

constructed under any public street; and if any sewer, drain, vault, arch or cellar is made in contravention of this Act, the Board of Health may cause the same to be pulled down, if they shall think fit, and the expenses incurred by them in so doing shall be repaid to them by the offender, and be recoverable from him in a summary manner.

SEC. 16. Any owner or occupier of premises adjoining any district may, with the consent of the Board of Health, cause any sewer or drain from such premises to communicate with any sewer of the Board, upon such conditions as they shall mutually agree.

SEC. 17. Whenever it appears to the Board of Health that any house or other building, already built, is without any waste pipe, drain or water closet, or that they do not empty into such place as is sufficient for effectual drainage, the Board may, by notice, require the owner of such house or building, within a reasonable time therein specified, to make a sufficient drain, of a construction approved by the Board of Health, emptying as follows; that is to say: If the sea or a sewer of the Board of Health, or any sewer which they are entitled to use, is within one hundred feet of the site of such house or dwelling, emptying as the Board may direct, either into the sea or such sewer; but if no such means of drainage are within that distance, then emptying into such covered cesspool, or other place, not being under any house, and not being within such distance from any house as the Board may direct; and if the person on whom such notice is served fail to comply with the same the Board may themselves do the work required, and assess the expenses to the owner or occupant aforesaid.

SEC. 18. The following rules shall be observed with regard to drains of houses not already built:

*First*—The drains of every such new house or building, as aforesaid, shall be covered in, and be of such size and materials, at such level, and with such fall, as may be effectual, in the opinion of the Surveyor or Engineer of the Board, to secure a proper drainage of such house or building and its appurtenances.

*Second*—If the sea, or a sewer of the Board of Health, or a sewer which they are entitled to use, is within one hundred feet of any part of the site of such new house or building, the drains so to be constructed shall communicate with such one of those means of drainage as the Board direct.

*Third*—If no such means of drainage are within that distance, then the last mentioned drains shall communicate with, and be emptied into, such covered cesspool or other place, not being under any house, and not being within such distance from any house, as the Board of Health direct.

*Fourth*—The Board shall have the power of enforcing and directing the construction of "dry privies," vaults or cesspools, whenever the nature of the ground, the building materials in use, the imperfect supply of water, or any other circumstances, shall render this necessary for the public health, especially for the preservation of the purity of streams, springs, or other sources of fresh water. But these privies or vaults shall be so constructed that their contents can be periodically, conveniently and safely removed for agricultural or other purposes; and they shall be effectually deodorized by some proper and sufficient drying or deodorizing agent, so that they will not be dangerous or offensive, either while undisturbed or during the process of removal.

*Fifth*—Any house or building, which, during the process of repairs, shall be pulled down to the ground floor, shall be subject to the same regulations as if it were a new house or building.

#### CLEANSING.

SEC. 19. The following works shall be done in respect to scavenging:

*First*—All public streets, together with the foot pavements thereof, shall be properly cleansed and watered; all roads shall be properly cleansed, and the whole or any part of such roads may, in the discretion of the Board of Health, be watered.

*Second*—All dust, ashes and rubbish shall be carried away from the premises of the inhabitants.

*Third*—All privies and cesspools shall be, from time to time, emptied and cleansed; but their contents shall first be deodorized. And the Board of Health may themselves undertake, or contract with any person to undertake, the aforesaid works, or any of them.

SEC. 20. In cases where the Board of Health do not themselves undertake, or contract with any person to undertake, the works heretofore named, they may make by-laws imposing on the occupier of any premises any or all of the duties of cleansing. They may affix reasonable penalties for the breach of said by-laws.

SEC. 21. Whenever the Board of Health shall be satisfied that the number of persons occupying any tenement or building is so great as to be the cause of nuisance or sickness, or a source of filth; or that any tenements or buildings are not furnished with vaults constructed according to the provisions of this Act, or with a sufficient number of privies or water closets, with underground drains, with proper ash pits, or with a proper water supply; or that, from any cause, they are in a condition which is prejudicial or dangerous to the public health, or to the health of the occupants themselves—they may thereupon issue notice in writing to such persons, or any of them—that is to say, the owner, agent or occupant, or either of them—to cause either or all of these deficiencies to be supplied, and the premises put into a cleanly and proper condition, within such reasonable time as they shall appoint; and, in case of neglect or refusal to obey such notice, they may themselves cause the alterations and cleansings to be done forthwith, and the expense of it shall be paid by such owner, agent, occupant, or other person. Or they may, if they think fit, issue notice to the persons inhabiting such tenement, or to the owner or agent, requiring them to remove from and quit the premises, within such time as the Board may deem reasonable; and if the person or persons so notified, or any of them, shall neglect or refuse to remove from said tenement or building, the Board of Health are hereby fully authorized and empowered thereupon forcibly to remove the same.

SEC. 22. The Board of Health may make and issue by-laws for the prevention of nuisances arising from filth, dust, ashes and rubbish, or from the keeping of animals, and may annex reasonable penalties for the breach of said by-laws.

SEC. 23. The business of a blood boiler, bone boiler, bone burner, fell monger, slaughterer of animals of any description not fit for human food, soap boiler, tallow melter, tripe boiler or other noxious or offensive business, trade or manufacture, shall not, without the consent of the Board, be established within the district; and the Board may make such regulations in regard to these occupations as they may deem expedient.

**Sec. 24.** When the contents of any sewer, or any accumulation of filth, are discharged into any river or stream, in the bed of which the quantity of water is so much diminished, either by drought during the summer, or by any other cause, as to be insufficient to keep the channel clear, the Board of Health may, by excavations or other operations, so deepen the channel as that the flow of water will be accelerated, and the contents of said sewers or drains be thereby prevented from accumulating and stagnating in parts thereof, to the injury of the health, and the annoyance of the surrounding population.

**Sec. 25.** No person, without the license of the Board of Health, shall throw into, or leave in or upon any street, square or vacant lot, or into any pond or body of water, within the limits of this town or district, any dead animal, dirt, sawdust, soot, ashes, cinders, shavings, hair, manure, oyster, clam or lobster shells, waste water, rubbish or filth of any kind, or any refuse, animal or vegetable, whatsoever. Nor shall any person throw into or leave in or upon any dock, flats or tide water within the jurisdiction of this district, any dead animal or other foul or offensive matter, except as above provided.

**Sec. 26.** The owners and occupants of livery and other stables within the limits of the town or district, as the case may be, shall not wash or clean their carriages or horses, or cause them to be washed or cleaned, in the streets, nor otherwise encumber the same. They shall keep their stables and yards clean, and shall not permit more than four cart loads of manure to accumulate in or near the same at any one time between the first day of May and the first day of November; nor within that period suffer the same to be removed, except between the hour of twelve at night and two hours after sunrise.

**Sec. 27.** Swine shall not be kept within the limits of the town without a permit from the Board of Health.

#### SLAUGHTER HOUSES.

**Sec. 28.** No place shall be used or occupied as a slaughter house except by permission of the Board of Health; and they may make by-laws with respect to their management, and for keeping the same in a wholesome state.

#### THE MARKETS.

**Sec. 29.** The Medical Health Officer, or either of the Inspectors or Agents of the Board of Health, may, at all reasonable times, enter into and inspect any shop, building, stall or place kept or used for the sale of butchers' meat, poultry or fish, or as a slaughter house; and to examine any animal, carcass, meat, poultry, game, flesh or fish which may be therein; and in case either of them, being intended for the food of man, shall appear to be unfit for such food, the same may be seized, and, if it prove to be unwholesome, he shall order the same to be destroyed or be so disposed of as to prevent its being again exposed for sale.

**Sec. 30.** No person shall land on any wharf or other place, or shall bring into town, any decayed or damaged grains, vegetables or fruit, without a permit from an officer of the Board of Health, and in such manner as he may direct.

**Sec. 31.** No person shall sell any adulterated or unwholesome food or drink; and if, upon being notified by the Board to discontinue such practice, he shall neglect or refuse to obey such order, he may be ejected

purpose. And he shall give certificates of said vaccination, without which no child shall be admitted to the public schools.

*Second*—The Board of Health is hereby authorized, empowered and enjoined, by itself or its duly authorized agents, to do any or all of the following things; that is to say:

(a) To make diligent inquiry in the month of January of each year to ascertain if the inhabitants have fully complied with the provisions of this section as hereinafter cited. In case of an epidemic existing or impending, this inspection shall be made forthwith.

(b) To notify, or cause to be notified, by a separate written or printed notice, the parents or guardians of all children who are not less than three months old, and all other persons who have never been vaccinated or had small-pox, to be vaccinated forthwith.

(c) To direct, if they shall deem it expedient, all persons who have not been more than once vaccinated, or who have not had small-pox or cow-pox more than once, or who have not had either of those diseases within a period of less than five years, to be re-vaccinated. In case of an epidemic the Board shall so order and direct.

*Third*—In case the party or parties regularly notified, as required in the preceding section, shall neglect or refuse to obey the orders or directions of the Board, or its agents, for a period of forty-eight hours or more, the Board may, and, in case of an epidemic existing or impending, shall proceed, by means of competent medical men, or well instructed and discreet students of medicine, to vaccinate them; or, if this is resisted or unreasonably refused, to separate them from others (whom they might expose to danger by their own neglect); or, to declare the house or tenement in which they reside a hospital, and forbid all communication with its inhabitants, except under the surveillance of the Board or its officers.

*Fourth*—The Board shall have the power, in cases where there are large numbers of persons sick of small-pox in common lodging houses, tenement houses or boarding houses, or where a single case occurs in such houses, and especially in cases of over-crowding with tenants, to remove the sick to a suitable hospital; or to vacate the house of its other tenants and cause it to be thoroughly cleansed and purified. And the tenants shall not be permitted to remove their clothing, carpets, bedding, etc., until they have been inspected or cleansed.

*Fifth*—The expenses of the alternative proceedings authorized in the second and third sections shall be chargeable to the owners or occupants of the premises; *provided*, that vaccination shall be free to all to whom the payment of a fee would be a hardship, and who do not resist the orders of the Board.

*Sixth*—The Board of Health is authorized, by itself or its agents, to enter any house or other tenement, for the purposes of this section, between the hours of seven A. M. and sunset; and, for the purposes of removal of bodies dead of small-pox, or of cleansing or purifying the premises from which they are taken, or the sick have been removed, between the hours of sunrise and midnight. But the agents of the Board shall in all cases first apprise the tenants of the objects of their visit.

#### INTERMENT OF THE DEAD.

SEC. 38. The Board of Health, with the consent of the corporate authorities, shall, from time to time provide in such places as, having regard to the public health, may appear to them expedient, and within or

without the limits of the city or town, burial grounds of sufficient extent for the decent interment of the bodies of all persons dying within the city or town; and it shall be lawful for the said Board, in case it appears to them necessary or expedient so to do, to enlarge any burial ground provided by them under this Act, and to make any road to such ground, or to enlarge or improve any existing road for facilitating the approach to such burial ground; and for providing any such burial ground, or improving it, they may purchase any lands which it may appear to them expedient to purchase for that purpose.

SEC. 39. They may inclose and lay out the burial grounds thus provided, and build therein suitable chapels for the performance of the burial service, and such other buildings and works as may appear to them fitting and proper.

SEC. 40. When the said Board shall be of opinion that interment (otherwise than in the burial grounds provided in this Act), should be discontinued wholly, or subject to any exception or exceptions, in any part or parts of the town, they shall, after due notice, order their discontinuance; and the grounds so discontinued shall be closed or fenced up in such manner as to protect the public health and secure proper respect to the bodies interred therein. And this section shall also be considered as applying to vaults under churches and chapels, as well as to the open burial grounds.

SEC. 41. The relatives of any deceased person, with the consent of the Registrar, or other person having charge of the closed ground in which the body of the deceased has been interred, and subject to the regulations of the Board, may cause such body to be removed to and reinterred in any burial ground provided under this Act.

SEC. 42. The Board, from time to time, may make regulations as to the depth and formation of the graves and places of interment, the nature of the coffins to be received in the burial grounds thus provided, the time and mode of removing bodies, and, generally, as to all matters connected with the good order of such burial grounds, and as to the conduct of funeral processions, and the convenient exercise of the rights of interment therein; and such regulations shall be printed and published, and shall be fixed and continued on some conspicuous part of every such burial ground.

SEC. 43. All burials shall be registered in books to be kept for the purpose, in the manner directed, and by the officer whose duty it shall be made by the Board of Health.

SEC. 44. No burial shall take place, except upon the written permit of the Registrar or Coroner, who, before issuing said permit, shall require to be furnished with the name, sex, age, rank, profession or occupation, and the residence, at the time of death, of said person; nor shall such permit be then issued, except the cause of the death of said deceased person shall be fully certified to the Registrar or other permitting officer by some regularly licensed and competent physician or surgeon.

SEC. 45. The Board may, at any time after the passage of this Act, build, or otherwise provide, in suitable and convenient locations, houses for the reception and care of the bodies of the dead, previously to and until interment, and make arrangements for the reception and care of such bodies therein, and appoint fit officers for such houses of reception; and they may also appoint or provide medical or other officers, who, in cases where the friends of the deceased so desire, may cause the body of the deceased to be decently removed to one of the houses of reception provided for under this section.

## GENERAL PROVISIONS.

SEC. 46. There shall be elected or appointed annually, or at such times as shall be determined by the corporate authorities, for the purposes of this Act, the following officers, who shall receive such compensation, and perform such specific duties, as shall from time to time be determined; that is to say:

*First*—A Medical Health Officer, or Registrar, who shall be a regular doctor of medicine, and who shall be the principal physician in ordinary to the Board of Health, or City Physician. He shall superintend, under the direction of the Board of Health, all the sanitary measures ordered by the Board, regulate all matters appertaining to the interment of the dead, and collect and record the births, deaths and marriages within his sphere of supervision. He shall furthermore make full and complete returns, monthly and annually, to the Permanent Secretary of the State Board of Health, in such manner and at such time as said Secretary may designate.

*Second*—An Engineer or Surveyor, whose duty it shall be to furnish all plans required for the use of the Board, to advise in relation to the construction and grade of the streets, the structure of the drains, the water supply, and generally with regard to all plans for improving the surface and substratum of the district.

*Third*—Superintendents of Streets, of Health (or Cleaning), of Drains and of Burials, whose duty it shall be to supervise and direct and execute the details of the various departments to which they shall be assigned, under the direction of the Board, of the Health Officer, or of such other persons as the Board of Health may direct.

*Fourth*—Such other officers as the corporate authorities may from time to time determine.

SEC. 47. Any person who shall violate the provisions of this Act, or any of them, or who shall obstruct the Board or any of its authorized agents in the performance of their lawful duties, or who shall do any act or acts by which the public health is endangered, shall be fined therefor not less than ——— dollars nor more than ——— dollars for each and every offence; and he shall be subjected to such other penalty as the Board of Health, with the approval of the councils, may fix and determine, and which are not repugnant to the Constitution and laws of the State, or in violation of the regulations of the State Board of Health.

SEC. 48. If any person feel aggrieved by any order of the Board of Health, or by the orders or acts of any of its accredited officers or agents, he shall always have the right of appeal to the Board of Health; or, if he so elect, he may prosecute such appeal in the Courts of law, as in such cases made and provided; but no such appeal shall be entertained by the Board of Health, unless said appeal is made within four months next after making such order or the doing of such act, nor unless ten days notice, in writing, is given to the party against whom the appeal is brought, stating the nature and grounds thereof; nor then, unless the appellant enter into sureties duly to abide the decision of the Board, or to prosecute his appeal in the proper Court.

SEC. 49. All Acts and parts of Acts heretofore passed, inconsistent with this Act, are hereby repealed; but this Act shall in no manner be so construed as to annul any of the already ceded rights or powers of the San Francisco Board of Health, which do not conflict with the operations of the State Board of Health.

The following form of return is inserted for the guidance of the various local Boards :

The Medical Health Officer, after ascertaining the condition of his district, shall make his report, in the following manner, to the Chairman of the proper committee of the Local Board of Health, viz :

Health Officer A. B., ———, District ———, reports the condition of premises No. —, ——— street, to be as follows :

1. PREVALENT SICKNESS.  
(Under this head, state what the disease is and how many are affected.)
2. OVERCROWDING.  
(State in figures the number of persons occupying the rooms or houses in *badly situated localities.*)
3. VENTILATION.  
(State if there is any, and, if so, whether it is by doors, windows or fireplaces; especially *when the apartments are closed at night.*)
4. DRAINAGE.  
(State simply if there is *any*, and whether it is "good" or "bad.")
5. FILTH AND RUBBISH.  
(State the kind, quantity (by estimate) and its specific locality.)
6. WATER SUPPLY.  
(State if there is a supply of water for *cooking, washing or bathing*, and of *what*)
7. DEAD BODIES IN SINGLE LIVING ROOMS.  
(State the cause of death and the general condition of the apartment and its inhabitants.)

He shall also make a record, in a book to be furnished him for that purpose, of the same facts, in tabular form.

#### FORM OF NOTICE TO ABATE NUISANCES.

(To be served by any officer competent to serve a civil process.)

To ———, No. ———, ——— street.

CITY OF ———  
OFFICE OF BOARD OF HEALTH, 18—.

SIR: Your premises having been examined, and ascertained to be in a condition which is, in my opinion, prejudicial to the public health, by reason of  
you are hereby required, in conformity with the provisions of an order of the Board of Health,  
passed ———, to ——— within ——— hours.

\_\_\_\_\_  
Health Officer.

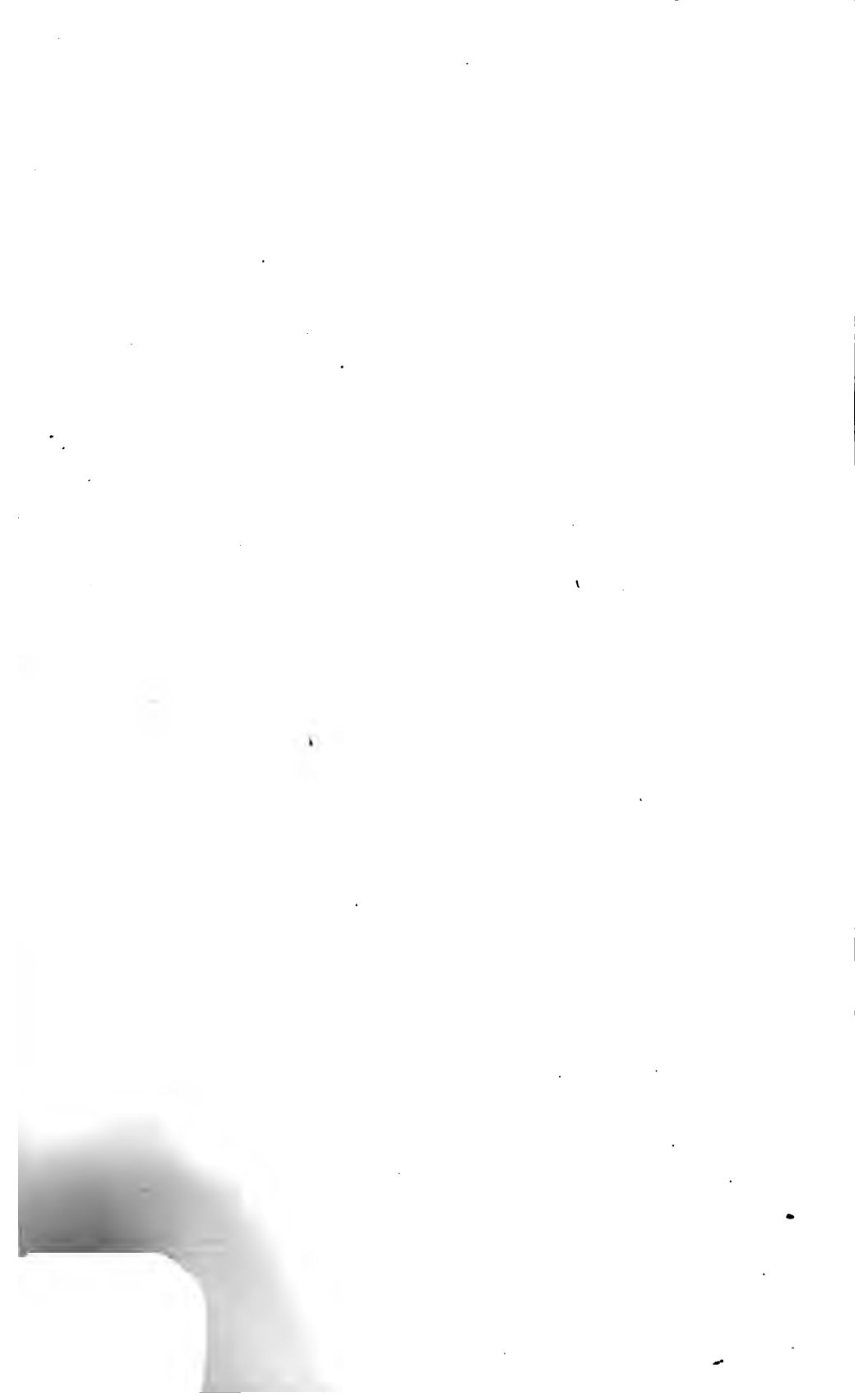
Approved :

\_\_\_\_\_  
Chairman of Committee of Board of Health.

#### EXTRACT FROM THE ORDER.

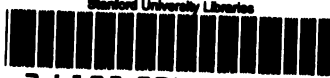
Ordered, That the Medical Health Officer, with the concurrence of the ——— Committee of the Board, be and he is hereby authorized to take such measures in regard to causes or occasions of danger to the public health of the city as he may deem necessary and proper for its preservation.











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